SMITHSONIAN INSTITUTION FEB 22 1867

MINING AND PETROLEUM STANDARD

AND

AMERICAN GAS-LIGHT JOURNAL.

Devoted to Mining, Petroleum, Gas, Water Supply, and Scientific Subjects Generally.

PUBLISHING OFFICE NO. 22 PINE STREET.

VOLUME VIII—No. 16. WHOLE No. 172. | NEW YORK, SATURDAY, FEBRUARY 16, 1867. | $3 PER ANNUM IN ADVANCE

Rotary Dynamometer and Oil Tester.

One of the peculiarities of Neer's *new* patent Rotary Dynamometer of January, 1867, consists in the method of ascertaining the lineal measure or distance the force is exerted, by taking it off on two or more sections of the periphery of a disk. Two or more three part flat link chains being attached to the disk passing over another disk, at the right of which are rollers to a sliding cross arm, on the hub of which is a clutch and scale bar showing the amount of force exerted; between this cross arm and the right hand disk are springs, the power of which are carefully ascertained by weight, and the scale bar graduated to the distance, the certain weight is moved and put into horse power on the bar. There is a teller wheel giving the exact number of revolutions of the machine, whereby we know the distance traveled under a certain weight at the point of resistance. The cut shows the machine as used at a coupling where there is a pully we make it loose and attach the left hand disk to the pully hub, the right hand disk being made fast to the shaft. All the power passing from one disk to the other, then weighed and showed on the scale bar in horse power.

The whole machine is made in parts as shown in a small cut, saving the necessity of taking down the shaft to apply the machine. Packings are provided to reduce from large to small, and can be removed at pleasure from the larger to the smaller shafting.

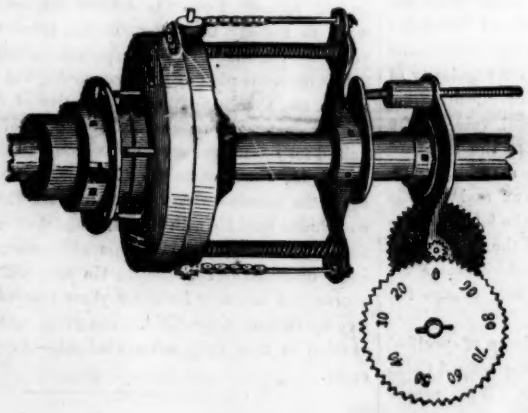
It is quite common to find errors in estimates of 25, 50, or 100 per cent. In four consecutive cases there was found over the latter, amount ranging as high as $2,500 yearly rent.

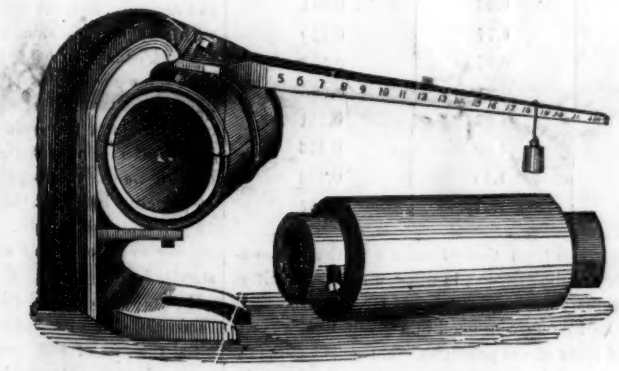
This Dynamometer will show at any moment the amount of power being used from the shaft to which it is attached; or the capacity of any engine or water-wheel; or the necessary power required to propel any machine. Also the adhesive or comparative power of various kinds of belting. It will also indicate any friction caused by irregularities of shafting, etc., and by attaching the register it will record all the power used for any desirable time, without regard to the number of revolutions or force exerted.

It also enables the public to deal in motive power as in other property, by actual weight or measurement, and with certainty and accuracy.

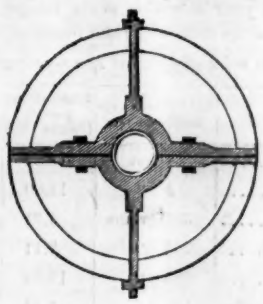
These machines are now used at different establishments, and give entire satisfaction.

They can be purchased, and also the right to manufacture and sell them in the different States, of the undersigned, who will attend to measuring power for parties in doubt of what they use themselves, or what they may let to others, and it will be shown that it is quite common that power is used varying more than one





NEER'S ROTARY DYNAMOMETER AND OIL TESTER.



hundred per cent. from the way estimates are generally made.

By a small Dynamometer in connection with the journal and box, or Oil Tester, (as fully represented in the illustration to the right,) run in any lathe, oil or any composition for lubricating is tested as to reducing friction, and as to how frequently it should be replenished. It will show also the best materials for boxing journals to avoid friction and wear.

For further information apply to Charles Neer, 81 Hicks street, Brooklyn. Manufactory, Dry Dock Iron Works, 435 East 10th st., near Ave. D, New York.

Chemical Action of Water in the Formation of Mineral Veins.

Water doubtless acts a most important part, not only in the formation of mineral veins, but also in the general metamorphism of rocks. Experiments show that by immersing wood in water, heated to a temperature of from 300 deg. to 350 deg., anthracite coal may be produced. At a lesser degree of temperature, bituminous coal is said to have been produced. In this connection, it may be interesting to call to mind the recent experiments of M. Bertholet, of Paris, by which that investigator has made the important discovery that at a high temperature various hydrocarbons combine with each other and with free hydrogen, to form higher carbides of hydrogen.

De Lenarmont, by the aid of water raised from 150 deg. to 350 deg., has produced samples of most of the minerals composing metallic veins, such as quartz, the carbonates of magnesia and zinc, spathic iron, sulphate of baryta, sulphide of antimony, mispickel, and ruby silver. These illustrations of the metamorphic chemical action of hot water, are most interesting studies, especially when taken in connection with the most undoubted fact, that nearly the whole surface of the earth was, at a comparatively recent period, but a seething cauldron of boiling water, holding in solution all the various salts which enter into mineral combinations; and with which the sedimentary formations, previous to the pliocene period, must have been saturated. The science of geology, as it progresses, is attaching more and more importance to this great agency in the metamorphism of rocks, and the formation of mineral and metalliferous veins.—*Exchange.*

—There are thirty iron manufactories in Chicago, several of which are almost exclusively engaged in preparing railroad iron, and altogether they do a business amounting to two million five hundred thousand dollars a year.

On the Combustion of Gas for Economic Purposes.

A Lecture delivered before the British Association of Gas Managers.

By Dr. Letheby.

(From the London Chemical News, No. 341.)

(Reprinted at Philadelphia in the Journal of the Franklin Institute.)

The first method of testing the illuminating power of gas was often used by the late Dr. Fyfe, of Glasgow, and when it was conjoined with another test, namely, the amount of condensation by chlorine, it was much relied on. The jet which he used had a diameter of the 1-33d of an inch, and the flame was kept at a uniform height of four inches. In this way he found that a given volume of gas of different qualities burnt out in different times, thus:

Durability of a Cubic Foot.

Common Newcastle coal gas....50.5 minutes.
Wigan cannel.....57.0 "
Lesmahago.....65.0 "
Wemyss.....75.0 "
Boghead.....81.0 "

Secondly, he further ascertained that the pressure necessary to make a gas burn from an aperture of a given size, and with a flame of a given height, was also the exponant of the quality of the gas; for the better the gas the less the pressure at which it burns, and the less also is the consumption to produce a flame of a given height. For example, with a jet 1-40th of an inch diameter, and a flame five inches high, the following were the rates and pressures of different gases:

Pressure, inch.	Consumption per hour, cubic foot.	Specific gravity of Gas.
0.6	0.67	0.841
0.8	0.77	0.720
1.0	0.86	0.552
1.2	0.94	0.595
1.4	1.02	0.551
1.6	1.09	0.515
1.8	1.15	0.486
2.0	1.21	0.461

His deductions from these results was, that the specific gravity of the gas—or, in other words, its quality—was inversely as the square roots for the pressures and that the volume consumed in a given time was as the square roots of the pressures. He relied so much on this test, that he thought it capable of taking the place of both the meter and photometer.

The third method of ascertaining the value of gas is by observing the height of a flame at a given pressure from a jet with an aperture of a given size. This method has been adopted by Mr. Lowe, and it goes by the name of Lowe's jet. It is, as you perceive, a modification of the preceding, for a poor gas will burn with a shorter flame than a rich gas; and by using a jet with an aperture of 0.04 of an inch in diameter, and a pressure of 0.5, the flame of 14-candle gas will be just six inches in height.

The fourth method for determining the quality of gas is by ascertaining the quantity of air necessary to destroy its light. The best instrument for determining it is the apparatus designed by Mr. Erdmann, and which is called a gas-prover. It is a sort of Bunsen burner with a contrivance for graduating the supply of air. Erdmann recommends the gas to be turned on until there is a flame of a given height, and then the supply of air is admitted until the light is destroyed. This, however, is not the proper way to use the instrument. The gas should first be turned on at a given rate, viz.: at the rate of 0.84 of a cubic foot per hour, and then the quantity of air necessary to destroy the light should be read off. In this way reliable results may be obtained, for the richer the gas the more air is required.

I referred in my last lecture to this diagram, which has been prepared from the experiments of Mr. King, of Liverpool.

Illuminating power of Gas as estimated by Erdmann's Gas-prover, the Gas burning at the rate of 0.84 cubic foot per hour.

	Description of Gas.			
	Newcastle Coal.	Equal parts Newcastle and Wigan.	Wigan Coal.	Boghead Coal.
Height of flame (inches)	1.87	2.00	2.75	5.50
Number of Index prover	14.72	23.89	32.78	61.84
Relative value of prover	1.00	1.59	2.22	4.15
Co-efficient of power....	0.70	0.70	0.72	0.70
Illuminating power (co-efficient 0.7.....	10.30	16.37	22.95	42.80
Illuminating power by Photometer.....	10.30	16.35	23.58	42.96
Relative values.....	1.00	1.58	2.29	4.17

Lastly, the common method for ascertaining the illuminating power of gas is by comparing it with a standard flame.

In this country the standard was formerly a wax candle burning at the rate of 120 grains per hour, but the variations in the value of the light were so great that it was abandoned; for, as a wax candle requires snuffing, it was difficult to decide when it was burning in a proper manner. After numerous experiments extending over a year, I ascertained that, for equal consumption, the light of wax and sperm was as 14 to 16; in other words, the power of sperm was just one-seventh greater than that of wax.

At present the standard flame in this country is a sperm of six to the pound, burning at the rate of 120 grains per hour. But for some time past this standard has also become uncertain—first, because there has been great irregularity in the construction of the wicks; and secondly, because the sperm is being adulterated with wax and paraffin, or both. The irregularity of the wick causes a variation in the rate of burning from 116 grains per hour to 140; and the real value of the light in the two cases, when reduced to the standard consumption of 120 grains per hour, is as 96 is to 115. The adulteration of the sperm with wax and paraffin also affects the value of the light, for the former gives 13 per cent. less light than sperm, and the latter gives 23 per cent. more light. These irregularities are becoming so serious that we must ere long change the standard.

In France the standard is a Carcel lamp of specified dimensions in every particular, burning refined Colza oil at the rate of 648 grains per hour. With proper precautions this standard appears to be very uniform, care being taken that the consumption of the oil is never less than 617 grains per hour, or more than 679.

And now, in concluding this part of the subject, I will direct your attention to the comparative power and value of the most important illuminating agents.

Relative value of different Illuminating Agents.

Name.	Rate of consumption per hour.	Illuminating power. (Sperm 120.)	Quantity—14 candles.
Cannel gas.....	4 feet	18.67	3 feet
Coal gas.....	5 "	14.00	5 "
Benzole.....	301 grains	4.91	857 grains
Paraffin oil.....	265 "	7.11	522 "
Sperm oil.....	686 "	10.00	900 "
Paraffin candles	122 "	1.46	1171 "
Sperm "	732 "	1.35	1440 "
Wax "	168 "	1.43	1652 "
Stearic.....	140 "	1.13	1732 "
Composite.....	144 "	1.08	1858 "
Tallow.....	145 "	0.83	2542 "

(To be continued.)

—A deposit of peroxyd of manganese, which it is thought will prove valuable, was struck on the 21st Nov, 1866, near the Mission Dolores, Cal., by workmen who were blasting rock.

Bessemer's Process for Steel Making.

At the time when Mr. Bessemer commenced his experiments, one of the great problems which exercised the minds of inventors was the discovery of some stronger material than cast iron for large guns. It was while occupied with this subject, that the idea occurred to Mr. B. of *blowing air through melted pig iron;* thus—instead of bringing the particles of iron in turn into contact with the air, as is done in the puddling operation—forcing the air into contact with the separated particles of iron. In 1856 he set up a cupola furnace for the trial. Five tuyere pipes, three-eighths of an inch in diameter, entered it near the bottom. The experiment was a dangerous one. The blast was turned on, and the melted iron was poured through the charging hole. The commotion that took place was most extraordinary; the melted iron dashed from side to side of the vessel; flames shot up from the mouth of the furnace, bearing large masses of slag. A heavy cast-iron plate suspended over the top dissolved in mist together with several yards of the chain by which it hung. No one durst approach to turn off the air. Affairs became alarming, and the fire engines were sent for; but before they arrived "the fury of decarburization had expended itself, and the product was run off."

The result was sufficiently satisfactory to induce Mr. B. to continue his experiments. It was soon found that by interrupting the process before decarburization was complete, the product was *steel*, and of good quality. But it was found, in practice, that the difficulty was to interrupt the process just at the right time, to produce the kind of steel which might be desired. In consequence, the discovery began to be neglected, and after a time was considered by many to be a total failure. Mr. Bessemer, satisfied that the principle upon which he had proceeded was the correct one, set himself to work to remedy the defect in his process. Several years were spent in further experimentation. At last he hit upon the plan of first completing the decarburization, and then introducing a quantity of fluid carburet of iron, containing the exact measure of carbon required for the iron or steel to be produced. The thing was done; but now the question was, how to introduce again the process which had fallen into disfavor. No one would meddle with it. He had but one alternative—to abandon the invention altogether, or to turn steel manufacturer himself. He adopted the latter course, and has now for some years carried on extensive operations in Sheffield. The great value of his invention is now duly acknowledged.—*Druggists' Circular.*

Bessemer Iron.

In spite of the difficulties attending the manufacture of iron, it is one of the metals first mentioned in history. Moses tells us that Tubal-Cain was an instructor of every artificer in brass and iron, and that iron furnaces were used in ancient Egypt. Homer, in speaking of the funeral games given by Archilles, in honor of Patroclus, informs us of the very great value of iron in those days, a mass of it being given as a prize:

"A mass of iron—an enormous round—
Whose weight and size the circling Greeks admire,
Rude from the furnace, and but shaped by fire.
* * * * * *
Who farthest hurls it takes it as his prize."

Diodorus Siculus relates that the inhabitants of the Island of Elba dig and cut iron out of the ground, afterwards melting it to obtain the metal. And now, even in this golden age, though centuries have passed since Hyphæstus threw the materials out of which Archilles' shield was to be forged, into a furnace urged by twenty pair of bellows, iron still retains its place in the scale of utility, if not in that of value.

Italy, in the many advances she has lately made towards political freedom, has not been behindhand in introducing the latest improvements in her manufactures. Early in 1865 an Englishman, Mr. Novello, in partnership with two Italians, commenced the erection of an extensive establishment near the city of Bombino, for the manufacture of malleable iron by the Bessemer process. We have before spoken of the principles which guides

the new manufacture of an iron approaching in quality to steel, but much cheaper. At the new Italian Works the Magona de'Italia, the Elba ore is employed and smelted first in an ordinary blast furnace; the liquid cast iron is then run off into a Bessemer converter—*i. e.*, an iron cylindrical vessel, somewhat of the form of a cupola furnace sufficiently large to refine 3,000 kilogrammes (6,100 pounds) of cast-iron at a time. The inside of the converter is lined with fire brick, and near the bottom are several vertical tuyeres (tubular nozzles) through which the air is forced by steam power. The air, in rushing through the bath of cast-iron, separates the carbon and other heterogeneous material from the iron. The time requisite for the conversion varies from 10 to 15 minutes, according to the purity of the iron and quantity of air driven through it. The converter is movable, so that it may be inclined to the right and left each time the crude iron is introduced or the refined metal is extracted. At the commencement of the operation scoriæ are formed and fully projected from the throat of the converting vessel, in a shower of fire; the flames, at first of a violet-red color, become yellow, and at last beautifully white; the sparks, however, gradually diminish, forming towards the end of the process a luminous jet composed of a succession of brilliant specks. The progress of the refining is indicated by the appearance of the flames, and to do it accurately, the spectroscope of Kirchoff and Bunsen has been applied by Dr. Roscoe, whereby the manufacturer is enabled to detect what substances are still entering into combustion and are, therefore, not yet completely removed. When the refining is supposed to be completed, the blast of air is stopped, the apparatus tilted, and the molten liquid poured into a caul-iron moved by a hydraulic crane. So soon as the cauldron is full, it is raised by the crane, which then rotates, carrying the cauldron over a circle of moulds prepared to receive the refined iron. Between five and six tons of this are daily turned out, the quality being much superior to iron manufactured by other processes. It solders very readily, possesses a malleability almost equal to copper, and whether hot or cold, may be bent or drawn into wire.—*Druggists' Circular.*

To Prevent the Water in Gas Meters, Gas Holders, and other Similar Reservoirs, from Freezing.

Formerly alcohol was used for this purpose, as it only freezes at 250 deg, below zero, Fah., consequently all watery liquids containing this substance will freeze at a much lower temperature than pure water, and alcohol is very effective. However, there are two objections; one is, that the price of the alcohol is so high, because of the internal revenue tax; and the most serious objection, that the preventive is only temporary, as the gas passing through the meter causes the alcohol to evaporate still faster than the water, which also disappears, and must be supplied from time to time, as is generally known. Solutions of common salt and other compounds soluble in water, have also been tried in gas meters, but they invariably attacked, in course of time, the metal of which the meter was made, and were therefore abandoned.

However, we have now a substance which is much cheaper than alcohol, never evaporates, but on the contrary, resists the evaporation of water, does not act injuriously on metals, is soluble in all proportions in water, and only freezes at about 160 deg. below zero, Fah.; this substance is glycerin. The amount to be put in a gas meter depends, of course, on its size, and the degree of cold to which it is exposed in the coldest winter nights. From one-half to one pint of glycerin to a gallon of water will be found sufficient for ordinary circumstances.—*Scientific American.*

[L. Bruckman, 67 Wall street, is agent for this material. His advertisement will be found in another page.—Ed.]

—Professor Blake has recently described a cobaltic variety of arsenical pyrites from Meadow Lake, in Nevada county, Cal. The mineral is known as Danaite, after the distinguished metallurgist of that name.

The Process of Roasting Ores.

Translated from the German of F. Plattner, for the Mining & Petroleum Standard and Am. Gas-Light Journal, by

J. H. TIEMANN.

[Entered according to an Act of Congress, in the year 1866, by Bryant, Callender & Co., in the Clerks Office of the District Court of the United States, for the Southern District of New-York.]

NUMBER XI.

e. Deportment of silver when argentiferous sulphur metals are subjected to an oxydising roasting—Loss of silver.

When the sulphur metals contain sulphuret of silver (which changes to metallic silver and sulphurous acid, in roasting, Article VI., *Gas Light Journal,*) or metallic silver, and change rapidly to free oxides, as iron pyrities, but little sulphate of silver appears to be formed, for the reason that the sulphuric acid has too much opportunity to exercise an oxidising influence on the particles of sulphuret of iron. But if sulphates are formed, which yield the greater part of their sulphuric acid undecomposed, only at a high temperature, and after all the sulphur metals have been oxidised, as basic sulphate of iron, and sulphate of copper, the former of which is more easily decomposed than the latter, because the oxyd of iron is a weaker base than oxyd of copper, nearly all the silver is converted into sulphate if sufficient sulphuric acid has been evolved, and if the temperatare is not so high as to decompose the already formed sulphate of silver (which does not decompose so readily as sulphate of copper), sulphate of zinc and manganese, which are formed in the roasting at a low temperature of such ores as contain sulphurets of these metals, undergo indeed a decomposition at a high temperature when air is admitted, but the necessary temperature, especially for the sulphate of manganese, is much too high to permit of the metallic silver being converted into a sulphate by the sulphuric acid set free. It must also be taken into account, that the sulphate of silver already formed, undergoes a partial decomposition in those places in the furnace where the temperature is the highest, especially near the fire-bridge, in which case a portion of the metallic silver set free may be lost by volatilization. Where this occurs in appreciable quantity, the silver contained in different portions of the mass will vary, and in order to get a fair average, it is necessary that the whole mass be thoroughly mixed, or (when lumps have been formed) ground in a mill.

Let us now consider the loss of silver by volatilization, which as experience has taught, occurs in the oxidising, roasting of pulverized argentiferous ores, and mill products. It must be remembered that in most cases the percentage loss is greater, the more spongy the mass becomes in roasting, and the less the quantity of silver contained This circumstance has been noticed by Von Tscheffkin, Winkler and Lampadius, and Malaguti and Durocher have proven by experiments, that the loss may be very large, especially in argentiferous zincblende. Although roasting experiments in a small way in a muffel, are no criterion, because in roasting in a large way, where the sulphuric acid set free from the sulphates is subject to a much greater pressure, and because the intermixed metallic silver is not so exposed to pure (undecomposed) air, the results are better; nevertheless, it may be proven conclusively by such experiments, that there is actually a loss of silver by volatilization where ores are roasted in a furnace, and that under certain circumstances the loss may be very large. In my earlier experiments I found, for instance, that in silicious ores free from zincblende, and which contained 0.05—0.06 per cent. silver, there was a loss of from 1-1 per cent. when roasted in a muffel, according to whether the ores were roasted slowly or rapidly, and whether towards the end of the experiment the heat was a dark or bright red. Brown zincblende containing the same amount of silver, loses under the same circumstances, from 15-66 per cent. of silver. These results agree with those obtained by Malaguti and Durocher.

This fact gives rise to the question (a), how is it that in ores of different quality, which, however, contain the same amount of silver, the per centage of loss varies, when subjected to an oxidising roasting? and (b) in what state does the silver evaporate?

a. Experiments on the loss of silver, when different substances are roasted.

In answer to the first part of the foregoing question, I have undertaken a series of experiments, which have led to most interesting results. I first mixed finely pulverized substances, and in most cases those free from silver, with pulverized argentiferous substances, on clay saucers, in such proportions that each mixture contained from 1-2 per cent. silver: I placed a number of these mixtures in a muffel which had been heated to a dark red, partially closing the apertures so that the draught of air was very slight, and gradually increased the temperature to the point at which sulphate of copper decomposes.

The substances used were iron pyrities, black sulphuret of zinc, anhydrous sulphate, free oxides, and quartz, the latter ground to a fine powder. The argentiferous substances were sulphide of silver finely divided, light and dark ruby silver, metallic silver, prepared from the chloride, sulphate of silver, arsenate of silver $3\,AgO, AsO^5$, and antimonate of silver AgO, SbO^5.

The roasted samples were scorified with granulated lead free from silver, using for each 37.5 grains lead, and according to circumstances borax glass, and the pure argentiferous lead (werkblei) which, collected under the vitrous-slag, was afterwards cupelled. In order at the same time to ascertain how much silver could be obtained from the argentiferous admixture in this manner—which always gives a slight loss by the absorption of the cupel—an assay was made either with a like quantity of the argentiferous admixture and the substance, when the latter contained silver, or separately when the substance was free from silver, using the same amount of lead as before; the difference of weight of the silver buttons gave the loss of silver in roasting.

The following tables give the details of the experiments:

Substance used for the experiment.	Parts.	Argentiferous admixture.	Parts.	Length of time roasted and temperature. Hrs	Degree.	Fine Assay Parts by wt. silver.	Loss of silver per ct.
Iron Pyrities	100	Sulphide silver	1.2	—	——	0.975	—
Do do	100	Do do	1.2	½	Dark red	0.970	0.5
Do do	100	Do do	1.2	1½	First dark then bri't red	0.950	2.0
Black Zincblende	100	Do do	1.2	—	——	1.030	—
Do do	100	Do do	1.2	½	like No. 2	0.970	5.8
Do do	100	Do do	1.2	1½	like No. 3	0.880	14.5
Do do	100	Light ruby silver	1.6	—	——	1.020	—
Do do	100	Do do	1.6	½	like No. 2	0.985	3.4
Do do	100	Do do	1.6	1½	like No. 3	0.870	14.7
Do do	100	Dark ruby silver	1.8	—	——	1.080	—
Do do	100	Do do	1.8	½	like No. 2	1.020	5.5
Do do	100	Dark ruby silver	1.8	1½	like No. 3	0.910	15.7
——	—	Metallic silver	1.0	—		0.965	—
Sulphate of Iron	50	Do do	1.0	1		0.940	2.5
Do do	50	Do do	0.5	1		0.460	3.5
Sesquioxyd Iron	50	Do do	1.0	1		0.935	3.0
Do do	50	Do do	0.5	1		0.460	3.5
Sulphate Copper	50	Do do	1.0	1	like No. 3	0.920	3.5
Do do	50	Do do	0.5	1		0.460	4.5
Oxyd Copper	50	Do do	1.0	1		0.915	5.0
Do do	50	Do do	0.5	1		0.450	6.7
Sulphate Zinc	50	Do do	1.0	1		0.910	5.7
Do do	50	Do do	0.5	1		0.420	6.5
Oxyd Zinc	50	Do do	1.0	1		0.870	9.5
Powdered Quartz	50	Do do	1.0	1		0.830	13.5
——	—	Sulphide silver	1.5	—	——	1.010	—
Magnetic Oxyd	50	Do do	1.5	1	like No. 3	0.900	11.0
Oxyd Copper	50	Do do	1.5	1	do	0.930	8.0
Powdered Quartz	50	Do do	1.5	1	do	0.830	18.0
——	—	Arsenate silver	1.5	—	——	1.020	—
Oxyd Zinc	50	Do do	1.5	—	like No. 3	0.975	4.4
——	—	Antimon'e silver	2.7	—	——	1.000	—
Powdered Quartz	50	Do do	2.7	1	like No. 3	0.950	5.0
Oxyd Zinc	50	Do do	2.7	1	do	0.950	5.0

[Editors of Journals may copy these articles by giving proper credit, and marking the same as copyrighted. Eds.]

To Whom the Origination of the Venango Petroleum Discovery is Due.

[*Continued.*]

GENERAL CHARACTER OF THE CRUDE PRODUCT.

The Crude Oil as is gathered on your lands, has a dark brown color, which, by reflected light, is greenish or bluish. It is thick even in warm weather, about as thick as thin molasses. In very cold weather it is somewhat more stiff, but can always be poured from a bottle even at 15° below zero. Its odor is strong and peculiar, and recalls to those who are familiar with it, the smell of bitumen and naptha. Exposed for a long time to the air, it does not thicken or form a skin on its surface, and in no sense can it be called a drying oil. The density of the Crude Oil is 882, water being 1,000. It boils only at a very high temperature, and yet it begins to give off a vapor at a temperature not greatly above that of boiling water. It takes fire with some difficulty, and burns with an abundant smoky flame. It stains paper with the appearance of ordinary fat oils, and feels smooth and greasy between the fingers. It is frequently used in its crude state to lubricate coarse machinery. In chemical characters, it is entirely unlike the fat oils. Most of these characters are common to Petroleum from various places. In one important respect, however, the product of your lands differ from that obtained in other situations, that is, it does not, by continued exposure to the air, become hard and resinous like mineral pitch, or bitumen. I have been informed by those who have visited the locality, that on the surface of the earth about the springs which furnish your oil, there is no crust or deposit of this sort, such as I have seen in other situations, where Petroleum or mineral tar is flowing. This difference will be seen to be of considerable importance, as it is understood and represented that this product exists in great abundance upon your property, that it can be gathered wherever a well is sunk in the soil, over a great number of acres, and that it is unfailing in its yield from year to year. The question naturally arises, of what value is it in the arts, and for what use can it be employed? To enable you to answer the enquiries, has been the object of my researches.

EXAMINATION OF THE OIL.

To determine what products might be obtained in the oil, a portion of it was submitted to fractional distillation.* The temperature of the fluid was constantly regulated by a thermometer, the heat being applied first by water bath, and then by a bath of linseed oil. This experiment was founded upon the belief that the crude product contained several distinct oils having different boiling points. The quantity of material used in this experiment was 304 grammes. The thermometer indicated the degrees of the Centigrade scale but for convenience the corresponding degrees of Fahrenheit's scale are added. The water bath failed to distill any portion of the oil at 100°C (=212° Fah.) only a small quantity of acid water came over. An oil bath was then substituted, and the temperature was then regularly raised by slow degrees until distillation commenced. From that point the heat was successively raised by stages of ten degrees, allowing full time at each stage for complete distillation of all that would rise at that temperature before advancing to the next stage. The results of this tedicus process are given in the annexed table—304 grammes of crude oil, submitted to fractional distillation, gave:

1st product at 100°C—212°Fah. (acid water 5 Grammes.

2d product at 140°C.—212° to 150°—283° to 302° Fah. 26 Grammes.

3d product at 150°C. to 160°C.—302° to 320° Fah. 26 Grammes.

4th product at 160°C. to 170°C.—320° to 338° Fah. 38 Grammes.

5th product at 170°C. to 180°C.—338° to 356° Fah, 17 Grammes.

6th product at 180°C. to 200°C.—356° to 392° Fah 16 Grammes.

7th product at 200°C. to 270°C.—392° to 428° Fah 17 Grammes.

8th product at 220°C. to 270°C.—127° to 518° Fah. 12 Grammes.

Whole quantity distilled by this method, 160 Grammes, leaving a residue in the retort of 144, out of the original quantity 304.

Product No. 1, as above remarked, was almost entirely water with a few drops of colorless oil, having an odor similar to the original fluid, but less intense.

Product No. 2 was an oil perfectly colorless, very thin and limpid, and having an exceedingly persistent odor, similar to the crude oil, but less intense.

Product No. 3 was tinged slightly yellow, perfectly transparent, and apparently as limpid as the 2d product, with the same odor.

Product No. 4 was more decidedly yellowish than the last, but was in no other respect distinguishable from it

Product No. 5 was more highly colored, thicker in consistence, and had a decided empyreumatic odor.

Product No. 6. This and the two subsequent products were each more highly colored and denser than the preceding. The last product had the color and consistency of honey, and the odor was less penetrating than that of the preceding oils. The mass of crude product remaining in the retort equal to 47.4 per cent. was a dark, thick, resinous looking varnish, which was so stiff, when cold, that it could be inverted without spilling. This showed no disposition to harden or skin over by exposure to the air. The distillation was arrested at this point in glags by our having reached the limit of temperature for a bath of linseed oil. The density of the several products of this distillation shows a progressive increase, thus:

No. 2	density,	.733
No. 3	"	.752
No. 4	"	.766
No. 5	"	.776
No. 6	"	.800
No. 7	"	.848
No. 8	"	.854

To form an idea of the comparative density of these several products, it may be well to state that sulphuric ether, which is one of the highest fluids known, has a density of .736, and alcohol, when obsolutely pure, .810.

The boiling points of these several fluids present some anomalies, but are usually progressive thus: No. 2 gave signs of boiling at 115.C. (=239 Fah.) and boiled vigorously, and remained constant at 225°C. to 228.C., (=437° to 420 Fah.) No. 3 began to boil at 120, (248° Fah.,) rose to 270° (=518° Fah.,) where it remained constant. No. 5 began to vaporise at 140° (=284 Fah.) rose to 290°, (=554 Fah.,) where it remained constant. On a second heating the temperature continued to rise, and passed 350° (581° Fah.) No. 5 gave appearance of boiling at 160°;(=320 Fah.) boiling more vigorously as the heat was raised, and was still rising at 308, (=581° Fah.) No. 6 commenced boiling at 135° (=275° Fah:.) boiled violently at 160° (=320° Fah.,) and continued rising above the range of the mecurial thermometer. No. 7 commenced ebullition at the same temperature as No. 6, and rose to 305°, (=581° Fah.,) where the ebullition was not very active. Much time was consumed in obtaining these results. We infer from them that the Rock Oil is a mixture of numerous compounds, all having essentially the same chemical constitution, but differing in density and boiling points, and capable of separation from each other by a well regulated heat.

The uncertainty of the boiling points indicate that the products obtained at the temperatures named above were still mixtures of others, and the question forces itself upon us whether these several oils are to be regarded as *educts* (i. e., bodies previously existing, and simply separated in the process of distillation), or whether they are not rather produced by the heat and chemical change in the process of distillation. The continued application of an elevated temperature alone is sufficient to effect changes in the constitution of many organic products, evolving new bodies not before existing in the original substance,

(To be continued.)

* Fractional distillation is a process intended to separate various products in mixture, and having unlike boiling points, by keeping the mixture contained in an alembic at regulated successive stages of temperature as long as there is any distillate at a gived point, and then raising the heat to another degree, &c.

Is the Water we Drink Good and Wholesome?

It is very clear that a satisfactory answer to this question cannot be founded upon chemical analysis alone. By this means we can ascertain the amount of inorganic matter in the water with great accuracy and as far as the elements are concerned, we can determine what such matter consists of. We can also show the influence of the inorganic or mineral constituents of the water in decomposing soap, and in other ways affecting its use for certain domestic or manufacturing purposes. It is but rarely that the mineral constituents of water from any of the ordinary water-supplies are such as in any way sensibly to affect the health of those who drink it. In a sanitary point of view, therefore, the inorganic or mineral constituents of drinking-water are looked upon as comparatively, if not wholly unimportant. It is organic impurity, and products resulting from its decomposition, that give to water the qualities most to be feared by those who drink it, and here unfortunately, chemistry does not aid us very much. It does, however, afford us some insight into the general nature of the organic impurity that is, or has been present in the water. We can determine, within certain limits, the amount of organic matter, not so accurately as we can determine the inorganic constituents, but sufficiently so for practical purposes. We can ascertain the presence or absence of nitrogen and sulphur in the organic matter, and thus judge of its animal or vegetable origin. Even if organic matter be wholly or almost wholly absent, we may discover products of its decomposition in the forms of ammonia or nitric acid, from which it may be concluded that there is a connection somewhere between the water and organic impurity, and that although the latter has been rendered harmless by its decomposition, slightly varying conditions might present it in a less advanced state of decay, in which it would be decidedly deleterious. Other products of decomposition such as sulphuretted hydrogen, would of course bespeak the necessity of avoiding its use, but this makes a direct appeal to the senses which hardly requires to be verified by chemical analysis.

But when the chemist has done his utmost through the excercise of his art, he can only represent, and that approximately, the quantity of organic matter, say one, two, or four grains in a gallon, and, by a more refined application of his art, the presence or absence of nitrogen in this matter. Beyond this he cannot specify its particular nature, source, or condition. The quantity is too small and the task too difficult to admit, in an ordinary analysis, of its examination being carried even as far as the available means of the chemist extend. The result of analysis are therefore usually expressed in very general terms.

All water employed for domestic purposes contains some organic matter, and if, as is stated "it is not the quantity of organic matter in water so much as its quality which determines its dangerous properties," what is the value of analysis in such a case, seeing that by this means the quality cannot be ascertained? Undoubtedly, taken alone, and in the form in which the results are usually expressed, analysis does not go for much, but it does, nevertheless, afford some assistance in judging of the extent in which the water has been exposed to the polluting influences of decomposing matter. This is, perhaps, of more value as a guide with reference to the dietetic use of water under ordinary circumstances than with special reference to cholera or other contagious diseases. In these cases we are told that modern pathological science has almost demonstrated that the real agents of such diseases are *living germs*, which the most refined appliances of the chemist have failed to discover, which chemical analysis cannot therefore indicate, and with reference to which no system of filtration can be depended upon for their removal.

In answering the question we have assumed to be put, we should neither wholly neglect nor exclusively rely upon the results of chemical analysis, but should bring to bear upon the subject every available means of ascertaining the past and present conditions to which the water has been subjected, so that we may draw our

conclusions from that which is unseen as well as from the results of direct experiment.

Thus, the exercise of common senses in the investigation of the conditions to which the water has been exposed, aided by the results of analysis, and some knowledge of physiological investigations and the laws of nature, will lead to the following conclusions with reference to this matter:

1. All water that has received drainage containing animal and vegetable matter in a state of putrefactive decomposition, and especially excrementitious matter, either is or is liable, to be in a state unfit for use as drinking-water, and the chemist cannot determine by analysis whether the dangerous state exists or not.

2. All rivers necessarily receive drainage, and they are generally contaminated with sewage and other decomposing organic matter, which may render the use of such water injurious to health.

3. Shallow wells situated in large towns are subject to pollution from infiltration, from leakage of sewers, and other similar causes, and as these waters are stagnant, the organic matter present, if it has not passed, is liable to assume its most dangerous condition

4. Spring water, when favorably situated, is free from suspicion of its containing organic impurity that could prove injurious to health.

5. Rain-water, if properly collected and stored, is the best and safest water to use for domestic purposes and especially for drinking.

6. In the absence of rain-water, or good spring-water, the best and most palatable water should be selected from other sources, choosing that which is most free from organic matter, and which has been least exposed to sewage contamination. In order to guard as far as possible against the influence of living germs, by which it is supposed that disease may be propagated, it is recommended on the highest authority, that when water to which a suspicion attaches is used for drinking purposes, it should be previously boiled, the heat of boiling water destructive to the vitality of such germs. A supply sufficient for the day should be daily submitted to the boiling temperature, and this after it has cooled may be rendered more palatable by the addition of a little syrup of lemon, or even a few drops of diluted sulphuric acid.—*London Journal of Pharmacy.*

Sodium Amalgam vs. Caustic Soda—Prof. Wurtz and the Daily Times.

We copy the following correspondence from the *Journal of Mining*, in answer to an article that appeared in the New York *Times*, at the request of Professor Henry Wurtz, and are desirous to do so, aside from any other motive, simply in the cause of Science, to undeceive the public at large, and guard mining interests especially from the ill effects of such articles which too often find their way into non-scientific journals. We previously had occasion to correct a statement in the *Times* very much to the prejudice of sodium amalgam to the effect that it was *explosive*. Now, they admit it is not explosive, but have assumed to have found a cheaper substitute for sodium, or sodium amalgam, which the Professor's letter will set at rest.

NEW-YORK, Jan. 24, 1867.

EDITOR JOURNAL OF MINING:

SIR:—My attention has been directed to the following paragraph, which appeared in the New York *Daily Times* of yesterday, on the subject of my new uses of sodium in amalgamation of gold and silver ores which paragraph is regarded by some of those who have devoted their time and means to assisting in the development of this new discovery, as mischievous and unjust to their interests, as well as calculated to mislead many mining men, and thereby damage their interests also; appearing, as it now does, in a journal of such wide circulation as the *Times*:

Sodium Amalgam Superseded in Gold Saving—The gold set free in extremely minute particles from crusted quartz, etc., is covered with an impalpable powder which shields it from the action of the mercury, intended for its separation and thus a considerable amount of gold is lost. In addition to this, the mercury thrown into a state of minute division by the agitation employed, being covered by the same impalpable powder, is incapable of reuniting; a considerable portion, therefore, assumes the appearance of fine powder, and is carried off with the refuse, and thus a large amount of mercury is wasted. These two sources of loss have caused a great diminution of profit. It was, however, fortunately ascertained that the brilliancy of the mercury is restored, so that it can run together freely and unite with the gold, with the greatest avidity, if a minute quantity of sodium amalgam is added to it. Hence, sodium amalgam is now an important article of commerce. It is considered highly explosive, and therefore very dangerous; but such is not the case. The explosive property of pure sodium, on coming into contact with water, is lost almost entirely when it is associated with mercury so as to form an amalgam But sodium amalgam is now likely to be superseded by a far less expensive, and it appears not less urgent material. Caustic soda has not only been found quite as effective as sodium amalgam, but it is contested that the sodium in the amalgam actually assumes the form of caustic soda before producing its effects. A very simple experiment will show the efficacy of the soda. If a finely pulverized metallic powder is thrown into water, no amount of stirring will cause it to fall to the bottom of the vessel; it is rendered specifically lighter than the fluid by the coating of air which adheres to it. But if a very small quantity of caustic soda or potash is added, it will soon descend from the surface to the bottom. It is supposed that the minute particles of mercury also, and of gold, are prevented from coming into contact by a coating of air, which the alkali removes in a way which has not been ascertained. This, if the real, is perhaps, not the only effect produced by the alkali. The potash of soda must not be allowed to lose its causticity by exposure to the air during transport, etc., or it will be ineffective; it may have become a carbonate without those who use it being aware of the fact.

I beg space of you, therefore, for a few words in reply. The use of caustic alkalies, such as soda and potash, has been familiar to mill-men almost from time immemorial; these being among the many nostrums which all of them have at one time or another tried in cases of difficulty in amalgamating the precious metals, or when their quicksilver became floured or "sick," as some term it. So far, however, is their use from being attended with the beneficial effects arising from metallic sodium that they have usually been absolutely found to augment the obstacles to success. In point of fact, one of the objections to sodium urged by intelligent mill-men, of some chemical knowledge, has been its necessary conversion, sooner or later, into caustic soda, the injurious effects of which they are familiar with; and it has repeatedly been necessary for me to reply to this objection by showing that the quantity of caustic soda thus produced is much too small to produce appreciable action of any kind. It is, also, so far from correct that "the sodium in the amalgam actually assumes the form of caustic soda before producing its effects," as stated in the *Times* paragraph, that another objection to its use repeatedly made by parties who have used it without previous instruction by me in the proper mode of use, has been that it is soon converted into caustic soda, thus entirely losing its valuable effects.

In the paper read by me, at the Buffalo meeting of the American Association for the Advancement of Science, on the use of sodium in amalgamation, which you have published in full, I refuted this idea of the effects of sodium being due to the soda formed by oxydation—which idea has already been presented by some writers in a California paper, founded as now upon the familiar phenomenon of the metallic or bronze powder floating on water caused to sink by alkalies. Most *chemists* would opine that *grease* had frequently more to do with this than air.

The error thus started on the Pacific coast has, it seems, been borne by the trade-winds around the world (having been reproduced, as I find, first in Australia and then in London), and has reached New-York on its way back to California, where it will no doubt reappear. My aforesaid refutation, in the mean time, like other truth, has subsided to the bottom of its well. Be kind enough, therefore, to allow me to pump it up thence, and pour it forth again to your readers. To wit:

"Another Californian writer has thrown out the suggestion that the difficulty of enfilming the particles of gold with quicksilver is due to strongly adherent films of air; and having observed, he said, that certain metallic powders are more easily wetted by *water* when the latter contains a caustic alkali, he imagines some obscure analogy between this case and the enfilming of gold by quicksilver, and then reasons therefrom that the virtues of the sodium must be wholly attributable to the *caustic soda* formed by its oxydation, and that the latter may be substituted for it. Had he made experiments upon some native gold before making his hypothesis, the latter would probably never have been made. The air-film occurred to me early in my investigations, but finding that under alcohol and *in vacuo* the refractory gold did not amalgamate better; I abandoned it. I may add that the effect of sodium is the same when no water is present at all."

Truly yours, HENRY WURTZ.

Correspondence.

Plastic Slate.

NEW YORK, January 28, 1867.

MR. NORMAN STONE, Fitchburg, Mass.:

Dear Sir:—Your question, "Is plastic slate durable as a roof covering?" has been asked many, many times. It is a proper question, and is not out of place when it is put to the advocates of that kind of roof covering. Though roofing is only one of the many uses to which it is adapted and in which it is, and will be, a blessing to man in all time to come, yet it is at present the most prominent use, and that for which the want is most imperious and pressing.

To answer it, I show you a mass of putty or dough, made of slate and coal tar and ask you to estimate its duration if laid on or in the ground where it is exposed to heat and cold, storms and frost? You reply (knowing the nature of slate), "It has no liability to decay—the slate is not perishable, but it may separate after the adhesive part of the tar is dissolved or evaporated, and then it will blow away like dust" This answer, you percieve, makes a change in the question, and it takes this shape: Will the plastic slate dissolve, or will the particles of slate separate from each other after the tar has all passed away? Well, I think it must do one of two things. It must gradually separate, or it must gradually solidify. If the particles of slate seperate, (and they surely will unless there is something besides tar to hold them together) then it is but a temporary covering; but if they unite and petrify so as form a *solid* out of a *plastic*, then it must be permanent and of inestimable value. At this point hundreds of intelligent men have stood. They say—"this point must be settled affirmatively or I won't invest my money in it." "Prove it. Prove it!" Well, sir, take this slate flour and mix it with coal tar—now make it into a cake and lay it in the grate right on the red hot coals, and let it burn till it is all red and will burn no more. What have you got? A cake of *slate stone*, somewhat cellular, but non-absorbant and indestructible. Now take another cake and put it in an oven 150 to 200° of heat—bake it two weeks What is it? A cake of *slate stone*, not so cellular as the other, and incapable of further change by the elements. It is non-absorbant. But what did it? What made it into stone? I don't know, unless the heat did it. The chemist says the affinity of the particles for each other and their angular shape did it. I don't know. I only know it is done. "But what has that to do with roofing; you don't calculate to burn your roof after it is spread on it, do you? Well, no, not exactly,—but I do calculate to let the sun shine on it sometimes, and that will do as well—in fact a good deal better, because the slower it petrifies the more solid it will be. Now look at these pieces of a roof that were actually exposed on a roof three years and have been around the office for specimens over one year. You see they are more perfectly petrified than those you have prepared. They are *solid, strong, slate stone*, bidding defiance to time and the elements. The suspicion of decay cannot be conjured by your utmost efforts.

It is absolutely *stone* and *slate stone* at that. This was done by nature's process alone. Artificial heat does well. This inkstand from which I dip was formed and baked and has held ink for one year, yet I know it is not as strong as solar heat would have made it—but it is strong enough to hold ink forever.

But one critic says, "I want to see a roof that has been covered with it a good many years, before I will believe." Very well. All you have to do is to wait. Get your life insured and wait; there are hundreds of roofs of plastic slate now growing older, year by year, and you'll have time enough to see them in fifty years.

I wonder how long it would take a Syrian to find out that a pine shingle, or tin roof, is better than his dirt roof with grass growing on it?

The fact is, Mr. Stone all you want to know is, that this mastic really does change to slate stone by the action of the sun and air.

That is the main point. If it does not, then regard it as temporary and of no more value than wooden shingles, except for its fire-proof qualties. If it does, then regard it as among the beneficent revelations of our Heavenly Father, for the comfort of His children in the latter days, when the world shall be incomparably more populous and will need all these newly discovered elements of comfort and wealth and many others yet to be revealed.

Respectfully, your obedient servant,

J. M ALLEN.

P. S. I send this through the *N. E. Farmer* because there are many other men asking the same questions, and may hereby be answered.

Railroad Track-Laying Machine.

Mr. W. D. Robertson, the inventor of the Railroad Track-Laying Machine, has constructed a model of the same, which he is now exhibiting to the mechanics and capitalists of this city in the room over the Blue Wing saloon on Montgomery, near the corner of Clay-street. The model on exhibition is of working size, being about six feet long and one foot in width.

It is placed upon a small track, in front of which is a section of road graded for receiving its track. When the machinery is set in motion it goes forward, dropping the ties, one after another, in place, until a sufficient number are laid for receiving a length of rail. The machine then stops for a moment while two rails are dropped into place from opposite sides of the machine, much as a boat is lowered from the cranes of a ship. The moment the rails are laid they are adjusted by attendants upon the ground, while the machine moves forward, dropping into their places the ties for another section. By the time these are in place and another set of rails swung over the side of the machine the attendants are prepared to receive and adjust them also. Thus the machine may move on, hour after hour, at the rate of 2½ miles every twelve hours. A scraper precedes the machine, to make smooth any trifling inequalities that may exist on the grade.

The arrangement for dropping the ties consists of a large wheel, built very much like the wheel of a stern-wheel steamer, without floats, only in this case the wheel is forward. It turns toward the machine. At the extremity of each set of arms are notches, into which, as they come slowly round, is dropped, by hand, a sleeper, that is carried down to the graded surface of the road, which the wheel overhangs, and at the proper interval, regulated accurately by machinery, the sleeper is dropped on its flattened side, while at the same instant four huge stamps (two only exhibited in the model) come down upon its surface with sufficient weight to bed it firmly in the earth and hold it in position, while two cutters, with knives like those of a planing machine, pass across its upper surface, cutting to its proper depth the seat or gain for the rail or chair. By the time this is done the next sleeper is on the ground, when the weights or stamps are immediately raised and dropped upon it, and so on. The sleepers are piled up in front of the wheel, and two attendants taking them up by either end, readily drop them, one after the other, into their places on the wheel. There are four or five sleepers upon the wheel all the time. As the car is propelled and the wheel turned by the same power and connected by gearing, everything operates like clock-work, and every timber must fall into its proper place and at the proper interval of time.

The machine is easily adjustible, may be made to drop its sleepers at any desirable distance apart, and will work upon curves. A supply train to any extent may follow the machine, across which, through its entire length, is laid two small side tracks, for hand cars, upon which the ties are carried from the rear of the train to the forward part of the machine. The rails, as they are wanted, are dragged forward from their place of deposit to the front of the machine over rollers, much as a log is dragged from a pond up the logway into the mill, by a donkey engine or by hand. The whole apparatus is extremely simple, compact and inexpensive. A machine for practical working can be constructed in this city for from $3,000 to $4,000. It is calculated that twenty-five men, by the aid of this machine, will be able to lay 2½ miles of track in twelve hours; while by the old method it will require over one hundred men to lay half a mile in the same time. The great saving of time and labor is chiefly effected in carrying the material forward upon the machine as the work progresses, doing the work with few men, no one of which is ever in the way of another, etc.

The whole machinery is arranged on true mechanical principles, and experienced machinists and railroad men who have witnessed the working of this model, express the opinion that it cannot fail to do its work, and do it accurately and effectually. The inventor is now exhibiting the same with the view of calling the attention of capitalists to its practicability, to the end that some one may be found who will furnish the means of first giving it a practical trial in this State. It is an invention which belongs to the Pacific coast, and one which we think is destined to play a prominent part in future railroad construction; and it is to be hoped, for the credit of our own mechanics, that it may be first put into practical use here.—*San Francisco Mining Press.*

Mining Items.

The San Francisco Weekly Stock Circular of January 12th gives the market rates of mining stock as follows:

The share market has been characterized by a good degree of activity during the past week, influenced to some extent, by the dividends disbursed and yet to be paid by the several companies. Some of the claims exhibit large gains in the bullion returns over previous receipts, with promising indications of a continuance.

Hale & Norcross still continues out of the market; $2,800 has been bid and $3,600 asked. This claim is in a very flourishing condition. From the 65 per cent. assay value of 2,765 tons of ore obtained from the mills during the month of December last, the yield was $144,348.35 in bullion.

Savage sold to a limited extent during the past week at $2.140 to 22,100, then at $1,950, s. 30 (ex- dividend) closing at $1.960 s. 60. During the month of December the bullion returns amounted to $214,847.39; out of the net earnings during that period, a dividend of $100 per foot was paid to the stockholders on the 8th instant.

Crown Point advanced materially under the favorable bullion returns for December, opening at $1,250 and at the close sold at $1,400. Bullion for December amounted to $184,854, an average of about $45 per ton. They pay a dividend of $100 per foot on the 15th inst., leaving a surplus of $36,000 in the treasury.

Yellow Jacket exhibited considerable activity, selling early in the week at $1,350. The yield of bullion in December was about $160,000; previous month $20,000. A dividend of $50 per foot will be paid to the shareholders on the 15th inst.

Gould & Curry is little enquired for, realizing $645 to $620, and at the close $615 is bid.

Imperial rose from $130 to $140, and closed yesterday at $145. In the month of December $81,045.67 was received in bullion. On the 7th inst. a dividend of $8 a share was paid to the stockholders.

Empire has been inactive during the past week, selling at $195 and closing yesterday at $180. This company is in a very prosperous condition. A dividend of $10 per share is payable to day.

Chollar Potosi met with marked activity during the past week, some 700 shares changing hands, opening at $217.50 and closing at $242. The ore recently discovered is said to be three feet wide, and may be considered worth from $35 to $40 per ton.

Ophir was quiet, selling at $155, then at $160 to $157.50 and closed at $154.

PATENT CLAIMS.

Pertaining to Gas, Mining, Petroleum, Water etc.

FOR THE TWO WEEKS ENDING FEB. 5, 1867.

61,542—Steam Generator.—Edward B. Jucket, Roxbury Mass:

I claim the combination and arrangement of the series of tubes, E, the fire-place A, the annular chamber, G, the water vessel, or drum, F. the pipes, D, the drum B, and the discharge-pipe, C, the whole being applied together substantially in manner so as to operate as herein-before set forth.

61,546—Steam Generator.—George W. Perry, Providence, Rhode Island, assignor to A. Perry, & Company, Boston, Mass:

I claim the improved boiler, or generator, as composed of a series of vessels, constructed, arranged, and connected in mannor as herein-before explained and as represented in the accompanying drawings.

I also claim each section or vessel, A, made with the convexities, or the corrugations of its opposite sides to project in opposite directions with respect to each other and with the ends and top and bottom of such vessel closed, in manner as above set forth and as exhibited in the said drawings.

61,593—Gas Regulator.—Alonzo H. Wood, Boston, Mass:

I claim an automatic gas regulator attachment, having the functions and possessing the characteristics substantially as set forth.

61,596 — Apparatus for Generating Carbonic acid Gas.—Steuben T. Bacon Boston, Mass. Ante dated, January 17, 1867.

I claim the arrangement herein described of the apparatus for facilitating the generation of carbonic acid gas from saccharine of farinaceous matter.

61,606—Carbureting Illuminating Gas.—W. H. Burridge, Cleveland O:

I claim the combination of an auxiliary gas, from the organic volatile hydro-carbons, with the common illuminating gas, as and for the purpose specified.

61,634—Lamp Burner.—Thomas Rowatt, London, England:

I claim the two domes, f and l, constructed with their openings, o, increasing in width, towards the base and the opening in the outer dome broader than the opening in the inner dome, in combination with their respec ive air passages, m, and passages, h and g, the passages to the one dome being independent of the passages to the other dome, all constructed so as to operate substantially as set forth.

61,650—Rotary Steam Pump.—H. O. Ames New Orleans, La.:

I claim the steam wheel, A, and screw or propeller blade, M, combined together and arranged and operating substantially in the manner and for the purpose described.

61,662—Liquids for Carbureting Gas and Air.—L. E. Holden, Cleveland Ohio:

I claim, First—The combination of benzine, or any other of the light hydro carbons with colzu, rape-seed, olive, or other equivalent or vegetable oils, for the purpose of carbureting air or gas when used for heating or illuminating purposes, substantially as specified.

Second—The combination of benzine, or any of the light hadro-carbons, with lard oil, or its equivalent animal oil, for the purpose of carbureting air or gas when used for heating or illuminating purposes, substantially as specified.

Third—The combination of one of the light hydro-carbons with one or more animal vegetable oils for carbureting air, or gas, substantially as specified.

Fourth—The application of the fluid, made by combining one of the hydro-carbons of light gravity with one or more animal or vegetable oils, to carbureting air, or gas, when used for heating or illuminating purposes.

61,702—Apparatus for Smelting Zinc Ores.—Alfred Borgnet, Swansea, England:

I claim the several improvements and combinations herein described.

61,714—Grinding Mill.—D. R. Clem, Front Royal, Virginia:

I claim the driver composed of the central piece, A, and the arms, B, united and arranged to operate substantially as and for the purpose set forth.

61,778—Gas Stove.—C. M. Young, and E. M. Benster, Detroit, Michigan:

We claim, First—The combination and arrangement of the ring, A', with the fire-cup, B, for the purpose described.

Second—The combination and arrangement of the movable combustion disk, C, with the wrought iron or copper generating chamber, D, substantially as and for the purposes set forth.

Third—The movable combustion disk, c, as described.

Fourth—The fire-cup D, as described.

OPPOSITION LINE.

TO CALIFORNIA VIA NICARAGUA,

SAILING EVERY TWENTY DAYS,

With Passengers, Freights, and United States Mails, on the following first class Steamships:

On the Atlantic Ocean.	On the Pacific Ocean.
Steamship Santiago De Cuba.	Steamship America.
" San Francisco.	" Moses Taylor.
" Dakota.	" Nevada.

PASSAGE AND FREIGHT AT REDUCED RATES.

Sailing days from New York.

1866	December 20th,	January 10th and 30th.
1867.	February 20th,	March 10th and 30th.
"	April 20th,	May 10th and 30th.

And so on at intervals of twenty days leaving on the Saturday previous, when a regular sailing day comes on Sunday.

For further information, apply at the Company's office, 177 West-st. corner Warren-st. N. Y.

66tf D. N. CARRINGTON, Agent.

BAY STATE FIRE-BRICK

—AND—

CLAY RETORT WORKS.

CHELSEA, MASS.

DAVIS & CHADDOCK,

MANUFACTURERS.

Office Nos. 125 and 127 Water-st., Boston.

Also agents for the sale of J.K. BRICK & Co's, Clay Retorts, Fire-Brick, Gas-House tile, etc. 66tf

Gas Fixtures and House Furnishing
GOODS,

E. V. HAUGHWOUT & CO.,

488, 490 and 492 Broadway.

Corner of Broome street, New York,

Manufacturers and dealers in

CHANDELIERS & GAS FIXTURES

Have a large and very choice assortment of GAS FIXTURES, which they offer at reduced prices, in view of the recent fall in gold. Their

Glass and Fire Gilt Chandeliers, are of entirely new designs,

And well worthy of attention by those who wish to purchase

☞ *Fine Fixtures for their Houses.*

OFFICE OF WM. DAVIDSON,
INSPECTOR OF GAS METERS FOR THE STATE OF NEW YORK.
☞ At the above address.

Architectural Iron Works,

13th and 14th streets, near Avenue C.

BRANCH OFFICE 42 DUANE ST.,

NEW YORK.

OFFICERS: D. D. Badger, President. N. Cheny, Vice Pres. and Acting Treasurer. C. C. Gordon, Secretary, Pro Tem.

PRODUCTS:

Iron and Fire-Proof Buildings, Iron Fronts, Rolling Shutters, Roofs, Domes, Bridges, Railings, Verandahs, Balustrades, Stairs, Cornices, Columns, Capitals, Arches, Window Lintels, and Sills, Consoles, Brackets, Rosettes, Urns, Door and Window Guards, Lamp, Awning and Horse Posts, Venetian Blinds, Patent Lights, Iron Side Walks, Rolled, Rivetted and Cast Iron Beams and Girders, and all Architechural and General Iron Work.

H. M. BAILY, Superindent of Works.
J. WALTER CLARK, Accountant. J. M. DUCLOS, Architect.

OREGON IRON FOUNDRY,

738, 740, 742 and 744,

Greenwich Street, New York.

CASTINGS FOR

GAS WORKS

OF ALL DESCRIPTIONS, INCLUDING

Purifiers, Exhausters, Compensators, Self-Acting Valves, Branches, Bends, &c.

FLOYD'S PATENT

Malleable Iron Retort Lid.

SABATTON'S PATENT

Furnace Door and Frame.

REFERS TO—J. A. Sabattan, Esq., Engineer Manhattan Gas Co—Col. A J. White, Metropolitan Gas Co.—C. C. Mowten, Engineer New-York Gas-light Co.—J. Mowten Saunders, Engineer Baltimore Gas Co.—John T. Harrison, Engineer Savannah Gas Co.

136] HERRING & FLOYD, Proprietors

SILAS C. HERRING. JAMES R. FLOYD

METROPOLITAN
GAS STOVE MANUFACTURING COMPANY.

Salesroom, 702 Broadway,

Above Fourth Street, New York.

PATENT GAS HEATING AND COOKING STOVES, RANGES, &c.

SCIENTIFIC GAS HEATING APPLIANCES,
For every known trade or profession.

PATENT PETROLEUM OR AEROVAPOR STOVES. PATENT KEROSENE OIL STOVES. PATENT PORTABLE VAPOR BATH APPARATUS.

Gas Stoves made by us are constructed under the immediate supervision of A. L. BOGART, Esq., Analytical Chemist and Gas Engineer. They contain recent improvements of a scientific character—by means of which a PERFECT COMBUSTION is obtained, and the Caloric produced, rendered CHEMICALLY PURE. Too much cannot be said against the use of Gas Stoves for heating apartments—when the products of combustion (Carbonic and Sulphurous Acids are emitted without purification into the atmosphere. Your Physicians will inform you, that this is a subject of vital importance) and worthy of your closest scrutiny—before purchasing. The public are invited to examine into the merits of these inventions.

Every article WARRANTED as represented.

KEROSENE

Cooking Apparatus.

All the cooking for a family can be done with Kerosene Oil, with less trouble and at less expense than by any other fuel.

Our stoves give no smoke or odor, and are not liable to get out of order, being as simple in every respect as a kerosene lamp. The Baker, Boiler, and Flat-Iron Heater are the only special articles of furniture required. For all other purposes, ordinary stove furniture may be used.

We would call attention to the fact that for the past three years, the Company has devoted itself almost exclusively to the manufacture of Kerosene Cooking Apparatus, and is prepared to guarantee that every article shall perform all that is claimed for it.

Liberal discounts to the trade. Send for circulars and price list.

KEROSENE LAMP HEATER CO.,

206 Pearl Street,

NEW YORK

THOMAS CASSIDY,

Iron Founder & Pattern Maker

Corner Hudson and Park Avenues,

BROOKLYN.

Iron Store Fronts put up at short notice.

Square and Round Columns, Truss Girders, Vault Beams, Window Lintels, Sills, &c.

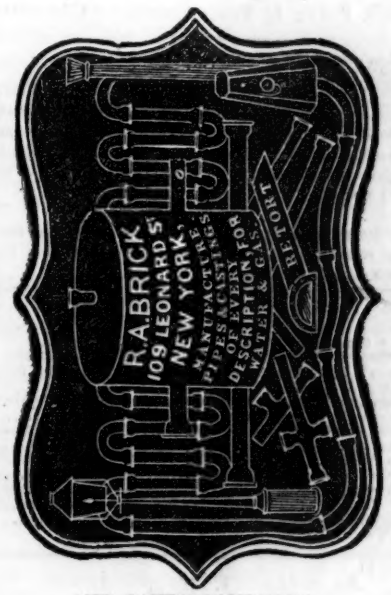
A large assortment of Railing Castings constantly on hand, or made to order, at the shortest notice.

Lamp Posts—Brooklyn Pattern.

☞ A large stock of the usual sizes of Round Columns kept on hand.

DRIVING PIPE,

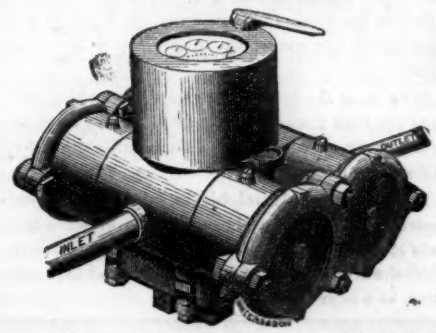
BERGEN IRON WORKS,



OFFICE 109 LEONARD STREET, NEW YORK.

AND BANDS COMPLETE.

H. R. WORTHINGTON'S



PATENT WATER-METER.

This Meter is also used for the measurement of Oil —it combines

ACCURACY, SIMPLICITY, and REMARKABLE DURABILITY with such ease and certainty of motion, as to offer no appreciable obstructions to the flow of water in the pipes to which it is connected, as it runs and registers upon three inches head, or when delivering the smallest stream. These qualities, with its low cost, have caused its extensive adoption by corporations and individuals, in many of our largest cities.

HENRY R. WORTHINGTON,
61 Beekman steet, N. Y.

WILCOX & GIBBS' SEWING MACHINE.

It is entirely noiseless. A patented device prevents it being turned backward. The needle cannot be set wrong. It received the gold medal of the American Institute in 1863. Send for a circular containing full information, notices from the press, testimonials from those using the machine, &c.

JAMES WILCOX,
Manufacturer, 508 Broadway, New York.

PRINCIPAL OFFICES:

NEW YORK—508 Broadway,
BOSTON—323 Washington-st.
PHILADELPHIA—720 Chesnut-st.
CHICAGO—133 Lake st.
CINCINNATI—50 West 4th-st.
LONDON—135 Regent-st.
HAMBURG—44 Herman-st
PARIS—82 Boulev'rd d Sebastopol
ST. PETERSBURGH—15 Gorochovay
VIENNA—9 Wildpretmarket.
BRUSSELS—12 Rue Croisade.
SYDNEY, Australia—212 Pitt-st.

Mining & Petroleum Standard

AND

AMERICAN GAS-LIGHT JOURNAL,

Published on the 2d and 16th of Each Month

At No. 22 Pine Street, New York.

BRYANT, CALLENDER & CO.,

EDITORS AND PROPRIETORS.

Profs. Partz & Buck, Consulting Chemists.

SATURDAY, FEBRUARY 16, 1867.

WISHING TO MAKE this Journal an organ of intelligent discussion to those of our readers who may wish to gain or give information on the subjects to which its columns are devoted, the publishers solicit letters from all among them who make the study of those subjects a pleasure, or a profession.

SUBSCRIBERS would confer a favor upon us by remitting CHECKS or POST OFFICE MONEY ORDERS, as we are frequent losers where money is enclosed in letters.

CONTENTS.

On the Combustion of Gas for Economic Purposes,... 242
Bessemer's Process for Steel Making..... 242
Bessemer Iron..... 242
To Prevent the Water in Gas Meters, Gas Holders and Other Similar Reservoirs from Freezing..... 243
The Process of Roasting Ores 243
To Whom the Origination of the Venango Petroleum Discovery is Due..... 244
Is the Water we Drink Good and Wholesome?..... 244
Sodium Amalgam vs. Caustic Soda—Prof. Wurtz and the Daily Times..... 245
Correspondence—Plastic Slate..... 245
Railroad Track-Laying Machine 246
Mining Items..... 246
Patent Claims 246
Answers to Correspondents 248
Metropolitan railways Etc.. 248
Gas, Metallurgy Etc 249

Answers to Correspondents.

X OF PENN.—A practical treatise on coal, petroleum, and other distilled oils, by Dr. Gesner, has been published by Baillierre Brothers, 520 Broadway, N. Y. E. Van Nostrand, 192 Broadway, N. Y., also have published late works, we believe, upon these subjects.

A. B. OF NEW HAVEN.—The process for making olifeant gas from alcohol, can be found in any large modern work on chemistry. Johnson's Text book on Chemistry describes it.

N. Y.—Gutta-percha is soluble in sulphide of carbon, spirits of turpentine and benzine, also in some fatty oils at a high temperature. Melted tallow will dissolve India-rubber slightly, if finely divided and kept some time at a high heat.

Metropolitan Railways, Bridges, Etc.

The great necessity for increased facilities of travel and transportation within the boundaries of our over-crowded city, and for communication with Brooklyn and other suburbs, by other means than those now in use, has given an opportunity to our inventors and engineers to bring forward and ventilate many a pet scheme for overcoming the formidable difficulties, which seem to stand in the way of any material improvement and extension of the system of inter-communication as established and operated at the present time. Some of these plans are doubtless feasible, and will in time be adopted and put into practical operation.

NEW PLANS FOR CITY RAILWAYS.—Of the numerous plans for increasing the traveling facilities in our crowded thoroughfares, may be mentioned two as most novel in their general features—the aeriel or elevated railway, and the subterranean or underground railway—the latter including the pneumatic or atmospheric plan of propulsion.

The plans for elevated railways as distinctive feature, anticipate the erection of iron columns to support the railways at a sufficient elevation above the roadway or the sidewalks or both, to permit free passage underneath. One plan devised by Mr. Marcus D. Moore, has as much merit as any we have seen. It proposes a line from the Battery to Central Park, along streets parallel to Broadway. The roadway is to be eighteen feet above the street, supported by a double row of iron columns, thirty-six feet high and one hundred feet apart, on a line with the curb-stones, and connected together with nine-inch wire cables. The track is placed half way up upon the columns that form an arch overhead. The braces and guys to sustain and steady the cable are attached to the arch, which will give the road the light and airy appearance of a grape arbor on a large scale, the lattices to be several feet apart. It will embody the principle of the suspension bridge constructed at a height sufficient not to interfere with the travel below. The columns will not incommode wagons or footmen more than lamp posts do now. The street below will not be shaded as the road and supports will be open, and the whole structure will be light and elegant. Dummy engines to propel the trains will be arranged to consume their own smoke and drop no ashes. Platforms are to be erected every few blocks, for passengers to get on or off. It is estimated the trip from the Battery to Central Park can be made in about twenty minutes. The plan is feasible and has met with favor with some of the best engineers, and we understand is to be submitted for legislative approval.

Plans have been proposed to have both car and foot roads sustained on the same columns one above the other, and side by side, each plan having assumedly specific merits.

UNDERGROUND RAILWAY.—The idea of penetrating the earth, or tunnelling beneath Broadway or other streets leading from the Battery to Central Park is not new, but it seems to be looked upon with more favor than heretofore, and a bill is now before the State Legislature for a plan of this kind. London has proved the practicability of the plan, where it is being largely used, and new routes are being constantly constructed, so there can be no risk in giving it a trial here.

One plan is to have the tunnel run in the rear of the Broadway buildings. Another is to be under the road proper; and yet another is to be placed under the pavements, and by proper skylights and landings, with stairways leading to the street above from an underground passage way for foot passengers, on a level with the basements of the stores, &c.

PNEUMATIC RAILWAYS.—While underground or airline railroads might obviate some of the difficulties, the speed of railroad travel may possibly be best improved by adopting the mode now in London for Postoffice purposes, whereby the parcels and packages are sent with incredible speed by exhausting the air at one end and pressure of air at the other, without the use of steam or other motive power. The same plan has also been employed and worked successfully for carrying passengers, and there is no reason why the pneumatic railway cannot be substituted for the mode of locomotion by steam now in use, especially in the city limits, both above and below ground. It could be employed to propel trains in tunnels under the East River to connect Brooklyn and New York, and also under the North River to communicate with Jersey City. It would avoid dust, dirt and smoke, and keep the air perfectly pure and healthful, and speed can be safely obtained at the rate of not less than one hundred miles per hour.

BRIDGES.—The ice blockade this winter has given an impetus to the general desire to have New York and Brooklyn connected by a bridge or bridges. Some years ago a plan was proposed for a suspension bridge to extend from Fulton street, at its junction with Sand street, Brooklyn side, to Chatham Square, New York. It was to be 150 feet above the river at the centre, to allow the unobstructed navigation for vessels of all kinds. Later, plans have been presented, one of the most novel is to build out broad and substantial docks or piers from each side, one-third the width of the river, and of a height sufficient to throw over the intervening space a single span. The docks or piers to be sufficiently wide to permit a roadway, and to erect stores on either side, while below the masonry will be built so as to form store-houses, etc., the rental of the stores and store-houses to pay for the cost of erection, while the bridge is to be free. Another plan contemplates an iron bridge, the iron to be cast in the form of boxes or arch pieces of oblong shape, banded together with wrought iron rods. Each box is to be bound to six others and then to be filled with concrete, which in time will form solid stone. It is claimed that great strength and rigidity would be thus secured. It certainly has the merit of novelty and cheapness. Mr. J. P. Stryker, 159 Broadway, N. Y., is the projector of this plan.

SUB-MARINE TUBULAR RAILWAY.—Mr S. A. Beers, Civil Engineer, of 34 Pine street, has proposed to construct a tube of boiler iron, 12 feet in diameter three quarters of an inch thick, resting upon an earth bed prepared by the dredge, by excavating and filling as the case may require, to form a level plateau or way three hundred feet in the centre of the river; so the tube will be twenty-five feet below low tide. Thence rising from each end of this level section at an inclination of five feet per 100 to each termini. A car to carry 300 passengers on the pneumatic principle is provided to traverse this tube, to make the round trip over and back in six minutes with 300 passengers, thus carrying 50,000 passengers per day. By this means a rapid conveyance is secured with perfect safety, and at an inconsiderable outlay, compared with the cost of a bridge or tunnel.

NEW PAPER.—We have received the first number of the "*News of the Week* for Americans." Published in London and Paris. It is a modest sheet printed in English and French, and to be devoted to general and "practically useful matter." It is an English supplement to the *Gazette des Etrangers*, which proposes to be an organ of international high life, as shadowed forth in this and the principal cities of the Old World. It is to contain a report of the Bourse and the individualities of Finance, Fashion, Theaters, etc., and will contain a special list of Americans in Paris during the International Exhibition. We heartily commend it to the public and those specially interested, and trust it may meet with success.

Gas and Metallurgy, Etc.

We wish particularly to direct the attention of our readers to the valuable articles we are now publishing "On the Combustion of Gas for Economical Purposes," from Dr. Letheby's lectures before the British Association of Gas Managers, also to Professor J. H. Tiemann's translations for this Journal from the German, of Plattner, on "The Process of Roasting Ores."

The important information contained in these papers are being appreciated, and frequently copied by our cotemporaries, which we are glad to see.

The San Francisco *Mining and Scientific Press*, one of our most enterprising and valuable exchanges, has the following notice of these translations:

PROCESS OF ROASTING ORES.—Under the above head, we this week commence the publication of a series of articles translated from the German of F. Plattner, by Professor J. H. Tiemann, M. E., a gentleman who has

passed considerable time in Germany and other portions of Europe, investigating the various processes of mining and metallurgy, as there practised and exhibited. These articles are translated originally for the NEW YORK MINING AND GAS-LIGHT JOURNAL, and will be reproduced in the columns of the *Mining and Scientific Press*, as fast as they appear in the Journal. We need not inform our scientific readers that the author of these papers in the original German was the ablest metallurgist of his age, and that his work from which the e papers are translated, is the most complete and exhaustive of any work upon the subject of roasting ores which has ever been written; yet, strange to say, it has never yet appeared in the English language, although there is a French translation of it. Our mining readers will find an amount of information in these papers which will repay for their perusal, and which alone will be worth more than a year's subscription to the *Press*.

IMPROVEMEMT IN STEEL PENS AND HOLDERS, by Geo. Stimpson, Jr., 37 Nassau Street, New York. This improvement consists in a peculiar shape, by which great strength and elasticity are secured, and of a simple arrangement, by which a tongue-like blade is caused to protrude from the holder, and thus at pleasure convert the ordinary into a fountain pen, while, by reason of the same arrangement, the pen can be cleaned with the greatest facility. Many specimens of writing, illustrating the capacities of these pens, were exhibited, and on trial the improvement showed itself, all that was claimed for it.—*Secretary's Report of the proceedings of the Franklin Institute for Pennsylvania, for November*, 1866.

LARGE SALE OF PITTSTON COAL.—A large number of persons interested in the sale of coal, assembled yesterday morning in the Merchants' Exchange salesrooms, to attend the great sale of Pittston coal announced for auction. Previous to the sale remarks were freely indulged in that the sale would break down, and the article in all probability have to be withdrawn. The result proved otherwise, as is shown by the following prices:

105,500 tons lump	$5 00
37,000 tons steamer	5 12½
20,000 tons grate	5 12½
18,600 tons egg	5 25
14,250 tons stove	5 40
11,000 tons chestnut	5 25

The quantity sold amounted in the aggregate to 207,800 tons, most of which was disposed of in parcels varying from 5000 to 15,000 tons each. The sales were almost exclusively to steamship owners and iron founders, consequently the apparent great reduction in the price will have little effect upon the retail market.—*N. Y. Herald, Feb.* 14.

—The gold fields of Nova Scotia do not appear to be very productive, not paying during the past summer more than ordinary wages and a very moderate interest on the capital invested.

SILVERSMITH'S HAND BOOK.

FOR

Miners, Metallurgists and Assayers,

Comprising the most recent improvements in the Disintegration, Amalgamation, Smelting and Parting of the Precious ores, with a comprehensive

Digest of the Mining Laws.

Fourth Edition—Profusely Illustrated.

1 Vol., 12mo. Cloth, $3 00

☞ Copies sent free on receipt of price. For sale by

D. VAN NOSTRAND,
Publisher and Importer, 192 Broadway.

Notice to Companies Operating in Lands, Mines, Railroads, etc.

AN ENGINEER AND GEOLOGIST WHO HAS had long experience in the Coal-fields, Collieries, Furnaces, and various descriptions of Mines, and in building Inclined Planes on prominent Railroads of the country, etc., is prepared for an immediate engagement. Can give suitable references. Address

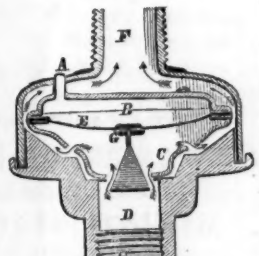
ENGINEER AND SUPERINTENDENT,
Lock Box 40, Richmond, Va.

WANTED—A SUPERINTENDENT FOR A GAS WORKS in the West. Must be competent to take charge of books, and thoroughly understand the business. Address G. A. GORDON, No. 40 Spruce street, N. Y. 8t

NOTICE

To Gas Companies and Gas Consumers.

THOMPSON'S GAS CONTROLLER.



The only perfect SELF-ACTING REGULATOR and burner combined ever invented or known to science.

This Automatic Gas Controller works upon a simple and well-known principle in Mechanics. The lower cut fully shows its construction. The conical valve at G is attached to the elastic diaphragm, E. As the gas enters in the direction as shown by the arrows, the diaphragm E is acted upon according to the pressure of the gas, and tends to close the valve upon its seat. The chamber, B, of the inner case communicates with the air by the orifice, (A). Hence the gas below the diaphragm is only balanced by the air above it and the valve falls or rises as the pressure varies, to regulate the admission of the gas, and consequently the pressure at the burner.

This Controller will save from 25 to 60 per cent. of gas according to the pressure in the mains, and gives a beautiful, steady light, at a minimum of cost.

Late improvements have made this Controller simple, durable, and an unrivalled gas economizer.

Reference is permitted to the following gentlemen:—

Col. CHAS. ROOME	Pres't Manhattan Gas Co.,	N. Y.
C. H. SAND, Esq.,	" Metropolitan Gas Co.,	"
J. H. ADAM Esq.,	" New York Gas Co.,	"
PETER COOPER, Esq.	Cooper Institute,	"
JOHN A. DUFF, Esq.,	Olympic Theater,	"
GEO. H. KITCHEN,	Inspector of Gas Meters,	"
A. L. BOGART, Esq.,	Gas Engineer,	"
Col. J. A. SABBATON,	Engineer Man. Gas Co.,	"
Col. A. J. WHITE,	" Met. Gas Co.,	"
J. K. SIMPSON,	" Cooper Institute.	"

Persons interested are invited to call at the office, 22 Pine-str't, where they can see the operation by pressure guage and test meters.

M. L. CALLENDER, Agent.
22 Pine Street.

SUPERINTENDENT.

PARTIES DESIROUS TO SECURE THE SERVICES of a SUPERINTENDENT of GAS and WATER WORKS, who has had an experience of twenty years in the above business, and who can give the best of reference, can do so by applying soon by letter or otherwise, to the Editors of this Journal.

BIRD, PERKINS & JOB,

IMPORTERS OF COAL FOR GAS, STEAM AND IRON Manufactures. Agents for the sale of the **Westmoreland** Coal Company's celebrated **Gas Coal**, and the Consolidation Coal Company's "Ocean Mine" **Cumberland** Coal.

Particular attention given to the charter of vessels at the lowest freights.

39 INDIA WHARF, Boston. 104 WALL STREET, N. Y.

BROOKLYN TUBE WORKS.

B. T. BENTON,

MANUFACTURER OF

WROUGHT IRON AND GALVANIZED

TUBES,

For Steam, Water, or Gas.

MANUFACTORY AND OFFICE,

Corner John and Adams Street, Brooklyn.

ALSO

58 John Street New York.

JOHN P. NESSLE. JAMES A. TAYLOR.

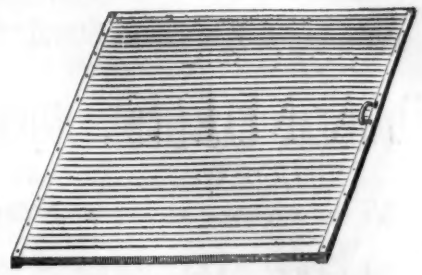
Nessle & Taylor,

MANUFACTURING ENAMELERS

OF

IRON AND OTHER METALS.

97 Water street, Brooklyn.



JOHN L. CHEESMAN,

MANUFACTURER OF PATENT CONICALLY SLOTTED SOLID WOOD TRAYS.

Two hundred per cent. cheaper than Iron and will last twice as long.

☞ All persons are cautioned against purchasing of any other person. Orders received by mail, or otherwise.

JOHN L. CHEESMAN,
147 and 149 Ave. C., New York City.

WANTED—A SITUATION BY A PRACTICAL **GAS ENGINEER** of experience. Can lay Mains and Service Pipes, and do all fittings required for Gas. Has been in his present situation eight years, and can give testimonials as to character and ability. Would not object to go abroad.

WILLIAM HUMPHREYS,
*tf Supd't Gas Works, Waterford, N. Y.

ANALYTICAL LABORATORY,

240 Pearl Street.

THE COPARTNERSHIP HERETOFORE EXISTING between G. W. MAYNARD and J. H. TIEMANN, has been this day dissolved by mutual consent. The business will be continued by the undersigned.

January 1st, 1867. J. H. TIEMANN.

EMPIRE LINE

FOR SAVANNAH, GEORGIA,

Every Saturday, the elegant Side-Wheel Steamships

SAN SALVADOR,

Commander, Joshua Atkins, and

SAN JACINTO,

Commander, Winslow Loveland.

Every SATURDAY, from pier 13 North River.

Have been placed on the route to Savannah by the Atlantic Mail Steamship Company of New York, and are intended to be run by them in a manner to meet the first class requirements of the trade.

The cabin accommodations of these ships are not excelled by any Steamers on the coast, and although their carrying capacity is large, their draught of water enables them to insure a passage without detention in the river.

San Jacinto,	Saturday, Oct.	6	San Jacinto	Saturday, Nov.	3
San Salvador,	.. "	13	San Salvador	.. "	10
San Jacinto,	.. "	20	San Jacinto	.. "	17
San Salvador,	.. "	27	San Salvador,	.. "	24

Returning leave Savannah every Saturday at 3 o'clock, P. M.

Bills of Lading furnished and signed on the Pier.

For further particulars, engagement of Freight or passage, apply to

GARRISON & ALLEN, Agents,
No. 5 Bowling Green.

Agent at Savannah, B. H. HARDEE.

THE

WASHINGTON MILL

AND

SILVER MINING COMPANY

OF ECHO DISTRICT, HUMBOLDT CO., NEVADA.

Capital Stock $300,000,

Issued for Mining Purposes.

60,000 Shares at Five Dollars each.

OFFICERS:
President.—J. Clements Stocker.
Vice President.— John J. Thomas.
Secretary and Treasurer.—Henry Lee Reynolds.
Superintendent.—William S. Sargent.

TRUSTEES:
J. Clements Stocker, New York city.
John J. Thomas, New York city.
Lewis W Phillips, New York city.
P. Page Davis, Unionville, Nevada.
Henry Lee Reynolds, New York city.

Office of the Company, 30 Pine street, New York.

☞ The mine of this company rapidly approaching that point of development which will necessitate the erection of a Mill, the Trustees are authorized to dispose of 10,000 shares of the reserve capital stock.

Sealed Tenders will therefore be received at the office of the company, 30 Pine street, Room 4, till December 20th, 1865, at noon. The officers of the company reserve the right to reject all bids under par.

ALBERT C. KUCK,

Manufacturer and Dealer in

COAL OIL

LAMPS,

CHIMNEYS,

BURNERS,

WICKS,

SHADES,

BRACKETS,

AND

CHANDELIERS

In all varieties and at manufacturers' prices.

AGENT FOR THE CELEBRATED

"Eureka" and "Nonpareil" Lanterns.

FRUIT JARS OF ALL KINDS AND SIZES.

57 FULTON STREET, NEAR CLIFF St.,

NEW YORK.

F. H. LOVELL & CO.,

Successors to Alfred Bliss & Co.

MANUFACTURER AND JOBBERS OF

KEROSENE

LAMPS

CHANDELIERS,

BRACKETS,

AND

Lamp Trimmings

GENERALLY.

Station, Sugar House, Street and Coal Oil Lanterns.

No. 233 Pearl Street,

159-182 *NEW YORK.*

Illustrated catalogues and price lists furnished on application.

NEW YORK LAMP COMPANY,

259 Pearl Street, New York.

We Would call especial attention to our recently improved

UNION BURNER,

which now burns without SMOKE OR ODOR. With Coal or Petroleum Oil makes the cheapest light known,

One Cent for Eight Hours.

The improved Union Burner without chimney, for a hand or portable night lamp is unrivalled.

Patented in the United States, England, France and Belgium.

NEW YORK LAMP CO.,

58 259 Pearl-street, near Fulton, New York.

Something New and Useful.

A POCKET LANTERN, which, when folded, occupies the space of a cigar case, and when open gives a good light. The most convenient article for any one who is liable to be out at night. Sample sent by mail on receipt of one dollar.

Address

NEW YORK LAMP CO.,

57 259 Pearl-street, New York.

The Aladdin No-Chimney Burner

GIVES A BRILLIANT LIGHT WITHOUT THE use of a chimney. Fits on to almost all kerosene lamps. It is the best no-chimney burner made, and no family should be without them. Samples sent by mail on receipt of 50 cents.

Address

NEW YORK LAMP CO.,

57-62 259 Pearl-street New York.

R. L. DELISSER & CO.,

DEALERS IN MINERAL LANDS

—AND—

PATENT RIGHTS,

No. 69 Beaver St., NEW YORK.

152-176

WILLIAM ELTING

Manufacturers Agents for the Sale of

PORTABLE AND

Stationary Steam Engines,

BOILERS AND MACHINERY,

No. 65 Liberty-St, NEW YORK.

☞ Leather and Rubber Belting supplied at usual rates. Circulars sent on application. 55-78

MOREY & SPERRY,

Manufacturers of

HEPBURN & PETERSONS, AND BEATH'S

Amalgamators, Stamp Mills,

Quartz Crushers, and other

MINING MACHINERY.

ALSO AGENTS FOR

Foundries in San Francisco, Cal., and are prepared to make time contracts to erect Mills completed, on the premises in California, Nevada and other Territories.

Office No. 95 LIBERTY ST., Rooms 10 & 11.

152-176 **New York.**

A. HITCHCOCK,

Inventor and Manufacturer of the

Cam Quartz Breaker and Pulverizer,

REVERSIBLE ROLLER MILL,

IDAHO MILLS & AMALGAMATORS,

Adapted to All Kinds of Power.

Unequalled for utilizing power—avoiding friction and wear,—rapidity of work, and facility of transportation and adjustment. Also, **Hitchcock's Adjustable Tubular Flue-cleaning Boiler,** and other valuable Patents, for which license to manufacture will be granted on reasonable terms.

Circulars furnished on application.

53-76 *Office No. 4 & 6 Pine Street, New York.*

GEO. H. BRONSON,

132 Maiden Lane, New York,

Dealer in

Paraffine Machinery Oil,

From PURE CANNEL COAL, adapted to all classes of

Stationary Machinery,	Woolen Factories,
Locomotive Engines,	Cotton Spindles,
Railroad Cars,	Sewing Machines, &c.

Paraffine Wax and Paraffine Wax Candles. Also the best brands of Burning Oils. All Oils guaranteed to answer the purpose for which they are recommended.

57 80

D. B. GRAY,

DEALER IN ALL KINDS OF

INDIA RUBBER GOODS

Vulcanized Machine Belting,

Conducting, Hydrant, and Engine Hose,

GUM STEAM PACKING,

Amidon's Improved Clothes Wringer,

And all kinds of Useful and Fancy Rubber and Vulcanite Goods,

No. 201 Broadway,

Middle of the Block between Fulton and Dey Streets, NEW YORK.

WILLIAM S. CARR & CO.,

Succesor to Sawyer & Co.,

SOLE MANUFACTURERS OF

Carr's Patent Water Closets,

URINAL VALVES, &c.

Also Manufacturers and Dealers in PLUMBING MATERIALS OF EVERY DESCRIPTION, Plumbers' Brass Works, Earthen Ware, Pumps, Iron Drain Pipes, Traps and Sinks, Copper Bath Tubs, Showers, &c., &c.

OFFICE AND MANUFACTORY

149, 151, 153, 155, 157 Centre Street, cor. Canal,

NEW YORK.

Illustrated Catalogue and Price List sent on application.

152-176

CHARLES H. REICHMANN,

Manufacturer and Jobber of

LAMPS,

Petroleum Stoves, &c.

AND IMPORTER OF

Porcelain Shades,

WICKS, &C.,

No. 45 Fulton St.,

[Bet. Pearl and Cliff]

NEW YORK.

ALL ORDERS promptly filled for his Patent Petroleum Stoves or Lamp Heaters, which are acknowledged to be superior to any other article of the kind now in use, as regards economy in consumption of oil, as well as simplicity of construction.

These Cooking Apparatus are used like any coal oil lamp, being provided with a sheet metal chimney, in consequence of which they burn without odor or smoke. They radiate no heat into the room, and are therefore very desirable in hot weather.

Also, Nursery and Night Lamps combined, a superior and cheap article for nursery or sick room; has a kettle, cup and pan, complete.

STEVENSON'S

Helical Jonval Turbine Water Wheel,

For first-class mills and factories where great economy of wate and simplicity and durability are required.

Manufactured by the Patentee,

J. E. STEVENSON, Hydraulic Engineer,

40 Dey Street, New York,

☞ Stevenson's Jonval Turbine Water Wheel gave the highest per centage of power over all others at the trial of Water Wheels at Fairmount Works, Philadelphia, March 9th, 1860. NINETEEN WHEELS WERE TESTED. The only practical test on record.

PORTABLE CIRCULAR SAW MILLS

With STEARN'S PATENT SETS, far superior to Rack and Pinion and Screw sets. Years of wear will not cause lost motion. All plank sawed with perfectly even thickness. No time lost in setting. Suitable for sawing any kind of Lumber and Timber.

SUPERIOR MULAY MILLS

With the latest improvements, at reasonable prices.

Steam Engines and Boilers

Especially adapted to lumbering purposes.

FOR SALE.

PORTABLE FLOUR AND GRIST MILLS.
WATER-WHEEL GOVERNORS.
ROTARY HAND AND POWER PUMPS.
RUBBER AND LEATHER BELTING.
CIRCULAR SAWS.

53-76

J. H. TIEMANN.

ANALYTICAL CHEMIST,

Metallurgist & Mining Engineer.

240 PEARL ST. Cor. BURLING SLIP, N. Y.

tf

MANHATTAN

Fire Brick & Enamelled Clay Retort Works,

MAURER & WEBER,

(Of the late firm of B. Kreischer & Co.)
PROPRIETORS.

Office & Works in 15th street, Avenue C,

MANUFACTURERS OF

Fire Brick and Tiles,

OF ALL SHAPES & SIZES,

Fire Mortar, Clay and Sand.

☞Articles of every description made to order, at short notice. (135

HY. MAURER. ADAM WEBER.

NEW YORK

Fire Brick and Clay Retort Works

☞ *Established in* 1845, ☜

(Branch Works at Kreischerville, Staten Island,)

B. KREISHER,

Office 56 Goerck St. cor. Delancey, New York.

GAS RETORTS, TILES and FIRE-BRICK of all shapes and sizes.
FIRE MORTAR, CLAY, and SAND.
Articles of every description made to order at the shortest notice.
B. KREISCHER.

J. K. BRICK & Co,

BROOKLYN CLAY RETORT,

—AND—

FIRE BRICK WORKS,

VANDYKE STREET, BROOKLYN, N. Y.

JOSEPH K. BRICK, EDWARD D. WHITE.

J. H. GAUTIER & CO.,

MANUFACTURERS OF

Gas Retorts, Tiles and Fire Bricks,

Black Lead Crucibles, and Carburet of Iron Stove Polish,

JERSEY CITY, N. J.

Refer to—Manhattan Gas Light Co., New York. [135

Philadelphia Fire Brick Works,

Corner of Vine and Twenty Third sts., Philadelphia,

JOHN NEWKUMET,

Manufacturer of all kinds of FIRE-BRICK, GAS-HOUSE TILES, to suit all the different plans in use. Clay Retorts and Dentists' Muffles. Orders filled at short notice.

PRINCE'S METALLIC PAINT.

AN INDESTRUCTIBLE COATING FOR

IRON, TIN, and WOOD.

It consists of seventy-two parts Oxide of Iron, and twenty-eight parts Cement Lime Stone in the one hundred pounds.

It has much more body than red or white lead. It is warranted perfectly water and fire-proof and to withstand a greater heat on metals without scaling, than any other paint in use.

It is a perfect cover for all kinds of iron, tin, or wood-work, out-houses, and canvas coverings. It prevents and arrests the corrosion of metals, and is not affected by the action of salt, gases, acids or ammonia.

It hardens under water, as has been fully demonstrated by its application to gas-holders, by many of the largest gas companies in the United States; which companies having thoroughly tested its properties as herein claimed, pronounce in its favor over any other paints in the market, even though said at double its price.

As a coating for patterns of iron or wood, when mixed with shellac, it is much superior to beeswax, oil, or shellac alone, as has been proven at the large founderies in the country.

For patching boilers and making joints, it is considered superior to red lead, or any other preparation.

For cleaning metals it takes the place of crocus, ouge, and emery, being better and cheaper.

This Paint requires no more oil than dry lead or zinc, and much less than the ordinary mineral paints. It is free from any waste, and possesses a spreading and covering power unequaled.

Terms, by the Barrel or Half Barrel, Five Cents per Pound.

A liberal discount made to parties purchasing by the ton.

A Barrel or Ton will be forwarded to any gas companies desirous of testing its qualities, for which there will be no charge if it does not give entire satisfaction as being the cheapest and most durable of all other Paints in the market.

Also, Prince's Imperial Black Paint, and Prince's Protoxide of Iron.

DANIEL SLOAN, General Agent,
115 LIBERTY STREET, NEW YORK.

Local Agent—CALVIN GAY, 29 Federal st., Boston.

AMALGAM BELLS,
AMALGAM BELLS,
AMALGAM BELLS,
AMALGAM BELLS

At prices within the reach of every Church, School, Cemetery, Factory, or Farm in the land. Their use throughout the United States and Canadas for the past six years has proven them to combine most valuable qualities. Among which are TONE, STRENGTH, SONOROUSNESS, and DURABILITY OF VIBRATION, unequalled by any other manufacture. Sizes from 15 to 5,000 lbs., costing TWO-THIRDS LESS than other metal, or 25 cents per pound, at which price I warrant them twelve months. Old bell metal taken in exchange, or bought for cash. Send for a circular to the manufacturer,

JOHN B. ROBINSON,
No. 36 DEY STREET, NEW YORK.

List of Academy, Steamboat, Fire-alarm, and Church Bells, with particulars as to Weight, Sizes, Price of Bells, Hangings, etc.

Weight of Bells.	Diameter.	Price of Bells without Hangings.	Price of Patent Hangings.	Price of Bell and Hangings complete.
225 lbs.	26 inches.	$56 00	$15 00	$71 00
275 "	42	69 00	18 00	87 00
375	36	94 00	22 00	116 00
450	34	112 00	25 00	137 00
600	02	150 00	30 00	180 00
750	39	188 00	35 00	225 00
1,000	64	250 00	42 00	292 00
1,200	48	300 00	45 00	345 00
1,400	50	350 00	50 00	400 00
1,600	52	400 00	54 00	454 00
1,800	55	450 00	60 00	510 00
2,000	58	500 00	62 00	562 00
2,500	60	625 00	72 00	697 00
3,000	63	750 00	85 00	835 00
3,500	66	875 00	87 00	962 00
4,000	69	1,000 00	100 00	1,100 00
4,500	72	1,125 00	113 00	1,238 00
5,000	75	1,250 00	125 00	1,375 00

List of Prices, Weights, and Sizes of Farm, Hotel, Steamboat, Schoolhouse, Shop, and Factory Bell.

These Bells are fitted with Yoke, Standard's Crank and Bolt, complete for use.

Weight of Bell and Hangings.	Diameter.	Cost of Bell and Hangings complete.
15 lbs.	7 inches.	$3 75
20	8¼	5 00
35	10	8 75
50	12	12 50
75	16	18 75
100	18	25 00
150	20	37 50
200	22	50 00
250	24	62 50

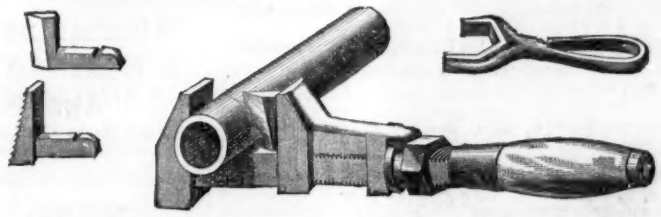
Larger Sizes made to Order at 25 cents per pound.

Guarantee.—All Bells sold at the above prices WARRANTED against breakage by fair ringing, for TWELVE MONTHS from time of purchasing. Should one fail, a new bell will be given by urning the broken one.

Orders may be sent through the AMERICAN ADVERTISING AGENCY, 389 Broadway, New York.

In case a Bell breaks after the expiration of the Warrantee, I allow HALF PRICE for the old metal. JOHN B. ROBINSON, 38 Dey Street, N. Y.

WEBSTER'S PATENT WRENCH,



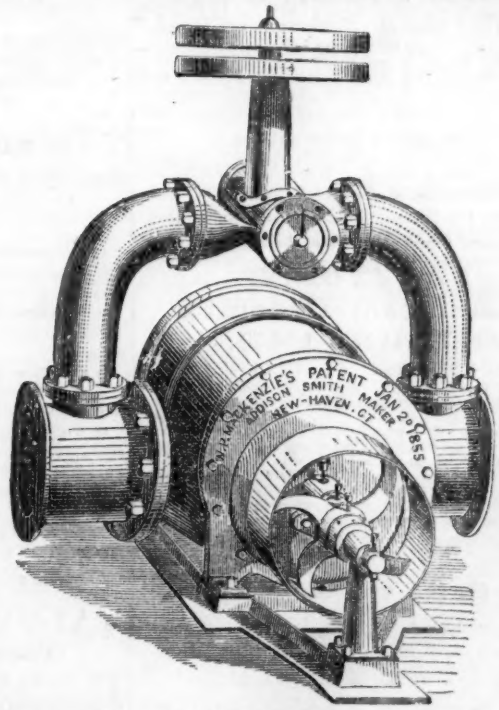
For Cutting Off & Screwing up Pipe, Round Rods, Bolts, Nuts, &c.

RECEIVED SPECIAL GOLD MEDAL FROM THE AMERICAN INSTITUTE
SEPTEMBER, 1865.

WEBSTER & CO.,
Sole Owners and Manufacturers, No. 17 Dey Street,
NEW YORK.

Smith & Sayre Manufactnring Company.

The Mackenzie Patent Gas Exhauster,
AND PATENT COMPENSATOR.



They are made to pass from 4,000 to 150,000 cubic feet of gas per hour; will increase the production and illuminating power of the gas, and add very much to the durability of the retorts, either clay or iron. The Compensator obviates entirely the necessity of water-joints, is compact, durable, cleanly, not liable to get out of order, self-acting, quiet, and certain in its operation.

We are also sole proprietors and manufacturers of the

MACKENZIE PATENT BLOWER, PATENT CUPOLA AND SMELTING FURNACE.

The Blower is a Force Blast machine, durably built, and can be driven with one-third the power required to drive the ordinary Fan. The Cupolas are manufactured in sizes to melt from 1 ton to 20 ons per hour, will save one quarter of the time required by the old style Cupola, and 33 per cent. fuel. Address

B. KREISCHER., Prest.
JAS. SAYRE, Treas,
CHAS. W. ISBELL, Sec'y Office 484 Broadway, New York.

GLYCERIN

For Wet Meters, Gasoline Machines, Hydraulic Presses, &c.

We warrant our Glycerine free from acid and not to corrode the Meter metal, or to congeal or freeze at a stated temperature—also, not to evaporate to any extent The advantages and savings derived from the use of our fluid can be testified by many Gas Light Companies which we have supplied. We only refer to the certificates of H. J. Miller, Esq., President of Cincinnati G. L. and Coke Co., and Dr. J. Lawrence Smith, Professor of Chemistry in the Louisville College, and President of the Louisville Gas Co.

HARTMAN & LAIST,

Office No. 41 East 2d street, Cincinnati,—Chemical Works on Providence street, and Miami Canal, near Findlay sreet.

CERTIFICATE

Office Louisville Gas Co., Louisville, June 28, 1865.

This is to certify, that the Louisville Gas Co. have used for about two years, the Glycerine prepared by Messrs. Hartman & Laist of Cincinnati, in their Wet Meters, and have in all instances found it to give most perfect satisfaction. Prior to the use of the above Glycerin, we had employed that manufactured by other parties, and we consider H. & L.'s superior to any we used.

J. LAWRENCE SMITH, President.

Office Cincinnati Gas Light and Coke Co., July 7, 1865.

This will certify, that Messrs. Hartman & Laist of Cincinnati, furnished this Company with Glycerin for Wet Meters some two years since It has proved very satisfactory, having resisted the action of frost during two winters and evaporating not more than six per cent. per annum, as guaranteed by them. The standard being, for density, 15 deg Beaume's scale. They were the first to introduce it practically to this Company. H. J. MILLER, President.

☞ L. BRUCKMANN, 67 Wall street, Agent for New York.

Worthington's Steam Pump,

Extensively used by

GAS-LIGHT COMPANIES,

For sale at greatly reduced prices. Also, a new and highly successful Pump, driven by water pressure, requiring no attention or repairs, and the most economical water motor yet constructed.

☞ Patent GATES for Water and Steam-stops. ☜

HENRY R. WORTHINGTON,
61 Beekman-st. New York.

61

JOSEPH NASON & CO.,

No. 61 Beekman street, corner of Gold,

NEW YORK.

Manufacturers of WROUGHT IRON PIPES and Fittings for Steam, Gas and Water, Boiler Flues, Steam Boilers, Coils, Heaters, Evaporators, Pumps, Ventilating Machinery, and Apparatus for Warming Buildings by Steam and Hot Water.

OIL TUBING, CAST IRON DRIVING PIPE, Boring Tools, Oil Pumps, Sand Pumps, Stuffing Boxes, Tongs, Clamps, Swivels, Joints, &c. 131

BRAYTON'S
Patent Steam Generator,
AND ENGINE.

A PERFECT SUCCESS. BY THIS INVENTION the long sought-for object has been accomplished; to wit: A means by which steam can be generated safely, so that there shall be no more danger from explosion than with the hot air engine, and at the same time retain all the power of the steam engine. This much sought for result has at last been accomplished, and after many severe tests we feel fully warranted in offering this Steam Generator and Engine to the public as a perfectly safe power, and at the same time a cheap power As a generator of steam for heating buildings, etc, there is not its equal in use. For further information or circular, address

R. A. HUTCHINSON,
159 182 Agent, No. 8 Dey-street, New York.

H. P. GENGEMBRE'S

PATENT

Non Freezing and Non Evaporating

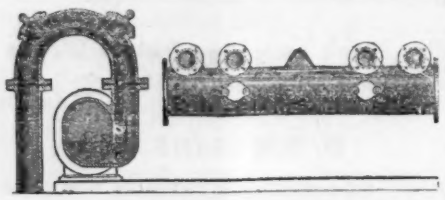
METER FLUID,

☞ Far cheaper than any other in use. ☜

For Filling Wet Gas Meters, cheaper, in the long run, than water.

Six years in general use in works using it, to the exclusion of all other fluid, and driving the dry meter out of use, enables us to recommend the patent with perfect confidence.

For information and purchase of rights, apply to A. DOISEY, Esq., Sole Agent, Box 2,180, Cincinnati, Ohio, or to H P. GENGEMBRE, Pittsburgh, Pa.



WILLIAM TAYLOR & SONS,
COLUMBIAN IRON WORKS,

Nos. 11, 13 & 15 Adams Street, Brooklyn, N. Y.

MANUFACTURERS OF ALL KINDS OF

Castings, Iron Buildings Store Fronts, Columns, Girders and Beams.

ALSO,

Gas Works Castings of all kinds.

Steam Engines, Mill Gearing, Hydraulic Presses for the manufacture of Linseed and Cotton Seed Oils, Sugar Mills, Single and Double Action Pumps, also Steam Pumps, Coal Oil Machinery, High and Low Pressure Boilers, Tanks, Kettles, Soap Curbs, &c.,

MADE AND REPAIRED AT THE SHORTEST NOTICE.

WM. TAYLOR. JAMES A. TAYLOR. EDWIN S. TAYLOR.

NATIONAL FOUNDRY
AND PIPE WORKS.

Office and Works—Carroll, Pike, Smallman and Wilkins Streets,

PITTSBURGH, PA.

WM. SMITH,

Manufacturer of all kinds of GAS and WATER PIPE, BRANCHES, CONNECTIONS, T's, ELBOWS, and ALL CASTINGS USED AT GAS AND WATER WORKS.

I offer special inducements to parties wishing to purchase, my Pipe is Smooth, regular in weights, and cast vertically.

N. B.—Pipe from 3-inch and upwards cast in 12-ft. lengths.

☞ SEND FOR CIRCULAR AND PRICE LIST. ☜

149

J. FIRMIN,
Gas Fitting and Plumbing,

Nos. 64 & 66 Maiden Lane, cor. William-st.

Residence, No. 1147 Broadway, near 26th-st.

HOUSES FITTED UP WITH PLUMBING AND GAS WORK IN THE MOST MODERN AND IMPROVED STYLE. SEWERS CONNECTED. BRASS AND LATHE WORK. JOBBING IN ALL ITS BRANCHES ATTENDED TO WITH PUNCTUALITY AND DISPATCH.

GAS BILLS REDUCED.

Gas Lights perfected upon New and Unerring Principles.

REFERENCES:

At A. T. STEWART'S the gas-lights were improved and the gas bills reduced one-third, amounting to several thousands of dollars per year.—A. O. WILLCOX, No. 40 Wall-st.

At the TRIBUNE ASSOCIATION gas bill reduced upwards of one hundred dollars per month, and better lights given.—SAMUEL SINCLAIR Publisher.

At H B. CLAFLIN'S, late Claflin, Mellen & Co., gas bill reduced—amount not yet ascertained—but it will be at the same ratio, and light improved.—Mr. BANCROFT.

At WM. SCHIEFFELIN & Co.'s, corner William and Beekman-sts., good light obtained and maintained at all parts of the premises, without additional cost—a result despaired of even by the Gas Co. owing to the deficiency of supply. No deficiency by FIRMIN'S system.

Similar results guaranteed under similar circumstances, or NO CHARGE. 65-88

THE AUBIN BALANCED
VALVE WATER METER,

(Used also for Oils and Liquors)

IS NOW IN USE BY MANY CITY WATER Companies, because of its LOW PRICE, SIMPLICITY, DURABILITY, ACCURACY UNDER ANY PRESSURE, and, (a great advantage,) because it runs with less head than any other meter used.

Manufactured by

H. Q. HAWLEY,
Albany, N. Y.

CATALOGUE of Scientific, Military, Naval and Miscellaneous BOOKS just published, and sen free on application.

D. VAN NOSTRAND,
PUBLISHER,
163 192 Broadway, New York.

PLASTIC SLATE ROOFING
JOINT STOCK COMPANY.

OFFICE 157 [Room 19] BROADWAY,

New York.

W. C. POTTER, Vice Pres't.
J. M. ALLEN, Sec. and Treas. LICENSES GRANTED.

PLASTIC SLATE
FOR
ROOFING & OTHER PURPOSES.

The process of reconstructing Slate Stone from a disintegrated state was

PATENTED FEBRUARY 21st, 1865.

It is a combination of

Pulverized Slate & Viscous Matter,

(the latter possessing qualities of geological and chemical affinity for the former,) and is a development of one of the simple but unalterable tendencies of nature.

As a Roofing Material it Stands Unrivalled.

A mastic—it adapts itself to every shape and slope. Non-combustible, impervious, non-expansive, and undecaying.

Frost does not Crack nor Heat Dissolve it.

The only roofing material ever discovered that will resist the action of the elements as long as the structure it protects. Being susceptible of little, if any wear, from exposure, and

Perfectly Fire-Proof,

It is unequalled as a coating for Railroad and Farm Buildings, Fences, Bridges, bottoms of Vessels, Vaults, etc.

Edw'd Van Orden & Co.,

Manufacturers of Fire and Water-proof

Plastic Slate Roofing Materials,

ROOFING TOOLS, &C.

Office 41 Liberty-st.

Edw'd Van Orden.
Jas. E. Dunn. NEW YORK.

MILLS CONVENIENT FOR SHIPPING.

PARTZ & BUCK

MINING ENGINEERS, METALLURGISTS

AND

ANALYTICAL CHEMISTS,

57 BROADWAY,

A. F. W. PARTZ, }
C. ELTON BUCK, } NEW YORK.

CHAS. HOWDON SMITH,
BROKER IN MINING STOCKS

AND OTHER SECURITIES,

No. 5 1-2 PINE STREET,

ROOM NO. 5, NEW YORK.

T. CASSIDY & CO.,

(SUCCESSORS TO P. CASSIDY,)

Dealers in Old and New

IRON, COPPER, BRASS,

LEAD, SPELTER, &c.

Corner of Bridge and John Streets,

BROOKLYN.

☞ N. B.—The highest cash price paid for the above named articles. ☜

T. CASSIDY. 57-80 J. PEARCE.

J. W. WHEELOCK,

DEALER IN

GASOLENE.

SUITABLE FOR GAS MACHINES, ALSO FOR CARBURETTING OF GAS, &c.

70 94 **204 Pearl St., New York.**

FOR SALE

THE VALUABLE IMPROVEMENT FOR SAVING and otherwise improving the gas, invented by Dr. J. S. Wood, described in the "Gas-light Journal" October 2d, 1866, is now for sale by State or County rights.

Address J. S. Wood, Patentee, No. 400 Library Street, Philadelphia, Pa.

T. B. BYNNER,

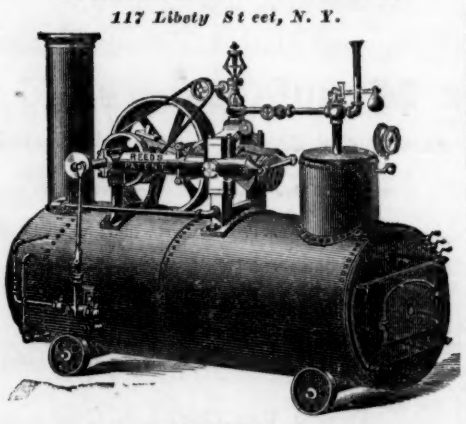
IMPORTER AND DEALER IN WATCHES AND JEWELRY, Agent for the AMERICAN WATCH. Also every variety of Swiss and English watches, AT THE LOWEST MARKET PRICES.

189 BROADWAY, NEW-YORK.
Opppsite John Street. 62-85

TURNBULL'S
AUTOMATIC PURIFIER.

STATE RIGHTS FOR SALE ON LIBERAL terms. For further information address by letter, WM. C. TURNBULL, care of T. C. Babcock, 59 Broadway, or to the Editors of this Journal.

REED & COGSWELL,
CONSULTING ENGINEERS,
117 Liberty Street, N. Y.



MANUFACTURERS OF
Slide & Oscillating, Stationary & Portable ENGINES,
Of all sizes. Also furnish all kinds of MACHINERY, TOOLS, AND GENERAL SUPPLY. Drawings of all kinds of Machinery executed to order.
JOHN A. REED. [63-86] W. B. COGSWELL.

JAS. O. SMITH & SONS,
MANUFACTURERS of LANTERNS,

81 FULTON, 55 GOLD, AND 90 ANN STREETS, N. Y.

We would especially direct attention to LATE IMPROVEMENTS in our No. 4 SMITH'S LANTERN, (for which we have applied for patent,) having a GLASS LAMP so constructed that the light passes through the bottom of the Lantern; also, the guards are so arranged as to dispense with soldering the top part of the guard to the trimming, obviating the difficulty that so frequently occurs in other lanterns of the guards melting off.

We are manufacturing at our factory, Middletown, Conn., MANY OTHER STYLES AND SIZES, which can be seen at our Show Rooms, 81 Fulton-st., New York. TRIMMINGS, etc., always on hand.

☞ The Trade are invited to call and examine our Stock.

EDDY'S
Kerosene Cooking & Heating
STOVES AND RANGES.

THESE COOKING STOVES WILL
☞ *Bake, Boil, Stew, Fry and Roast,*
With the greatest economy and facility, and without heating the room in which they are used. They are perfectly simple, operating like an ordinary Kerosene Lamp with a chimney, and are the only Kerosene Stoves that burn without smoke or odor.

"We have been perfectly astonished to see what a labor-saving, dirt saving and heat-saving institution is EDDY'S PATENT KEROSENE STOVE. Taking the cost of running it, and the result attained, it is the best patent in the market."—*Worcester Daily Spy.*

Our Heating and Cooking Stoves are very convenient and economical, especially where a fire is required but a few hours at a time.

Orders for Stoves may be sent through American Advertising Agency, 389 Broadway, New York.

ALEX. M LESLEY,
Manufacturers, No. 605 Sixth Ave., New York.
Send for Illustrated Circular. (136

KNITTING MACHINES
FOR
Families and Manufacturer,
☞ *Something New and Invaluable for Family Use.*

We offer the public the simplest, strongest and best Knitting Machine in the world.

It occupies but little space—is portable and can be attached to a stand or table, weighs about 40 lbs.

It will knit a variety of Stitches—the breakage of needles is trifling—the cost of needles is insignificant and the most delicate material can be knit pure and spotless, as the needles are not oiled.

Orders for Machines may be sent through the American Advertising Agency,
389 Broadway, N. Y.
Send for a Circular—Agents wanted.
DALTON KNITTING MACHINE CO.,
137] 537 Broadway, N. Y.

WEED'S
HIGHEST PREMIUM
Shuttle Sewing Machine
Has only to be seen and operated to be Appreciated.

Call and see for yourself before purchasing. Please bring samples of various kinds of thread, (such as is usually found at stores,) and various kinds of fabric, which you know the former most popular Sewing Machines either cannot work at all, or, at best very imperfectly.

SUPERIORITY.
over any other Machine in the market will be seen at a glance.

1st It runs easily and rapidly, and is so constructed as to endure all kinds of hard usage.

2d. No breaking of threads in going over seams.

3d. No imperfect action of the feed at uneven places in the work.

4th. The Weed-stitch catches of itself, and will sew from the finest lace to the heaviest leather, and 200 cotton to coarse linen thread.

5th. The Weed Machine will do beautiful quilting on the bare wadding, without using inner lining; thus leaving it soft as if done by hand.

6th. The variety of fancy work that can be done on the
WEED MACHINE,
with so little trouble, makes it equal, if not superior, to six machines combined; for instance, it Binds, Hems, Tucks and Sews on the band at the same time, and in face, the
WEED NO. 2 MACHINE,
as before stated, is equivalent to a combination of any six ordinary machines.

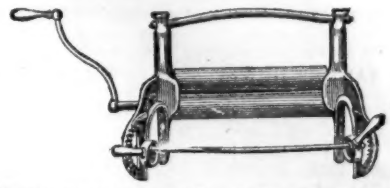
Orders for Machines may be sent through the American Advertising Agency 389 Broadway, N. Y.

Below we give a few prices:

No. 2. Oil Black Walnut, Ornamented with Hemmer.	$60,00
No. 2. Oil Black Walnut, Hall Case, Ornamented, with Hemmer.	65,00
No. 3. Extra Oil Polished Black Walnut, Half Case, Large Table beautifully Ornamented.	75,00

WEED SEWING MACAINE Co.,
136, 506 Broadway, New York

PUTNAM'S CLOTHES WRINGER.
IT IS THE ONLY RELIABLE
Self-Adjusting Wringer.



No Wood-work to Swell or Split. No Thumbscrews to get out of order. Warranted with or without Cog wheels.

It took the First Premium at Fifty-seven State and County Fairs in 1863, and nearly double that number in 1864, and is, without an exception, the *best* Wringer ever made. Patented in the United States, England, Canada, and Australia. Agents wanted in every town, and in all parts of the world. Energetic agents can make from $3 to $10 per day

WHAT EVERYBODY KNOWS, VIZ.:
That Iron well galvanized *will not rust.*
That a *simple* machine is better than a complicated one.
That a Wringer should be *self-adjusting, durable, and efficient.*
That thumb-screws and fastenings cause *delay* and *trouble* to regulate and keep in order.
That wood soaked in water will *swell, shrink,* and *split.*
That wood-bearings for the shaft to run in *will wear out.*
That the Putnam Wringer, with or without cog wheels, will *not tear the clothes.*
That cog-wheel regulators are not essential.
That the Putnam Wringer has *all* the advantages, and *not one* of the disadvantages above named.
That all who have tried it pronounce it the *best* Wringer ever made.
That it will wring a thread or a bed-quilt *without alteration.*

We might fill the paper with testimonials, but insert only a few to convince the skeptical, if such there be; and we say to all, *test* Putnam's Wringer. Test it *thoroughly* with *any* and any others, and if not entirely satisfactory, return it;

PUTNAM MANUFACTURING CO.—*Gentlemen:* I know from practical experience that iron well galvanized with zinc will not oxydize or rust one particle. The Putnam Wringer is as near perfect as possible, and I can cheerfully recommend it to be the best in use. Respectfully yours,
JOHN W. WHEELER, Cleveland, O.

Many years' experience in the galvanizing business enables me to indorse the above statement in *all particulars.*
JOHN C. LEFFERTS, No. 100 Beekman St.

NEW YORK, *January,* 1864.—We have tested Putnam's Clothes Wringer by practical working, and know that it will do. It is cheap; it is simple; it requires no room, whether at work or at rest; a child can operate it; it does its duty thoroughly; it saves time, and it saves wear and tear. We earnestly advise all who have *much* washing to do, with all intelligent persons who have *any,* to buy this Wringer. It will pay for itself in a year at most. HORACE GREELEY.

PRICES—$8, $9, and $10.
Sample Wringers sent, express paid, on receipt of price.
Manufactured and sold, wholesale and retail, by
PUTNAM MANUF'G CO.,
13 PLATT STREET, New York,
BENNINGTON, Vt.,
CLEVELAND O.

C. GEFRORER,
MANUFACTURER OF
Gas Heating Apparatus
OF EVERY DESCRIPTION,
Gas Burners, &c.
No. 529 COMMERCE STREET,
PHILADELPHIA, PA.

Burners for Wood Coal Oil and Water Gas
Gas and Lava Burner Tips
Constantly on Hand 65

THE AMERICAN METER CO.

Organized under the General Manufacturing Laws of the State of New York

SAMUEL DOWN, President. HENRY CARTWRIGHT, Vice President. RICHARD MERRIFIELD, Secretary and Treasurer

Trustees.

SAMUEL DOWN, WILLIAM HOPPER, R. H. GRATZ, HENRY CARTWRIGHT, RICHARD MERRIFIELD.
THOMAS C. HOPPER, *Superintendent at Philadelphia.*

This Company is now prepared to furnish WET AND DRY GAS METERS, STATION METERS, GOVERNORS, PRESSURE INDICATORS AND REGISTERS, SERVICE and METER COCKS, and all other articles in their line appertaining to the use of Gas-Works.

The combination of Mechanical and Scientific Skill, and the long experience of the several members of the Company, is a sure guarantee of durability, accuracy and excellence of workmanship. Orders addressed

AMERICAN METER COMPANY,

West Twenty Second Street, New York. Arch and Twenty Second Streets, Philadelphia. No. 23 West Street, Boston will meet with prompt attention.

Harris & Brother, Practical Gas Meter Manufacturers,

Continue, as heretofore at their old Establishment, No. 1117 CHERRY ST., PHILADELPHIA, to Manufacture

WET AND DRY GAS METERS, and all kinds of GAS APPARATUS, and furnish all articles appertaining to the use of Gas Works. ☞OUR WORK WARRANTED—Satisfaction Guaranteed. Orders respectfully solicted, and promptly attended to, by
HARRIS & BRO., No 1117 Cherry st., Philadelphia.

Messrs. Harris & Brother, Philadelphia Gas Works, February 14. 1857.

Dear Sirs;—I take great pleasure in stating that we have found your meters to register with entire correctness, and to be generally of very good quality—the number furnished by you to these works is over 5,000.
John C. Cresson, Engineer;

Office of the Gas Light Company of Augusta, Ga., March 6th, 1858.

This is to certify that having used meters manufactured by Messrs. Harris & Bro., for the last nine years, we do not hesitate to state they have given entire satisfaction in point of wokmanship and accuracy of registration; they are surpassed by none, and equaled by few manufactories in the Union; we have used meters made by other establishments but our preference is in favor of those made by Harris & Bro., of Philadelphia, Pa.
G. S. Hookey, Superintendent of the Gas Light Company of Augusta, Georgia.

Messrs. Harris & Brother, Philadelphia. Philadelphia, March 4, 1858.

Gentlemen—We take great pleasure in bearing our testimony to the very superior character of the meters we have received from your establishment. We have always found the workmanship all we could desire, while the accuracy and reliability of their measurement have always been satisfactory. We have used meters made by other parties, and none have given as entire satisfaction as those received from you. We are, gentlemen, very truly, yours, Birkinbine & Mears.

Messrs. Harris & Brother. March 14, 1857.

Gentlemen—For the last ten years we have used in the Philadelphia Gas Works, meters made in your factory, and take pleasure in expressing my opinion to their correctness. On several occasions I have taken your meters apart, and found the material used in the manufacture of the same, to be as fine quality as is used in those imported from Europe, or made by any of the manufactur in the United States. Respectfully Yours George Wiegand, Inspector of Gas Fittings, Philadelphia

C. GEFRORER,

MANUFACTURER OF GAS BURNERS,

529 Commerce Street, Philadelphia, Pa.

Burners for Wood, Coal Oil, and Water Gas. Brass and Lava Burner Tips Constantly on Hand.

GROVESTEIN & CO.,

PIANO FORTE MANUFACTURERS,

499 BROADWAY, NEW YORK.

THE ATTENTION of the public and the trade is invited to our New Scale, Seven Octave, Rosewood Piano Fortes, which for volume and purity of tone are unrivalled by any that have hitherto offered in this market. They contain all the modern improvements, French Grand Action, Harp Pedal, Iron Frame, Over-strung Bass, etc., and each instrument, being made under the supervision of Mr. J. H. Grovesteen, who has had a practical experience of over thirty years in their manufacture, is fully warranted in every particular.

THE "GROVESTEEN PIANO-FORTE"
RECEIVED THE HIGHEST PREMIUM AT THE
CELEBRATED WORLD'S FAIR.

Where were exhibited instruments from the best makers of London, Paris, Germany, Philadelphia, Baltimore, Boston, and New York; and also at the American Institute for five successive years, the gold and silver medals from both of which can be seen at our warerooms.

By the introduction of improvement we make a still more perfect Piano-Forte, and by manufacturing largely, with a strictly cash system, are enabled to offer these instruments at a price which will preclude all competition.

PRICES!

No. 1,	Seven Octave,	round	corners,	Rosewood, Plain Case, $275
No. 2,	"	"	"	Heavy Moulding 300
No. 3,	"	"	"	Louis XIV style 325

a fac-simile of the accompanying cut.

TERMS—Net Cash, in current funds Descriptive circular sent free on application.

MORRIS, TASKER & CO.,

PASCAL IRON WORKS

[ESTABLISHED 1821,]

PHILADELPHIA,

Manufacture Wrought Iron Welded Tubes for Gas, Steam or Water; Lap-Welded Boiler Flues, GALVANIZED WROUGHT IRON TUBES,

ARTESIAN WELL PIPES,

of Wrought or Cast-Iron, screwed together, flush inside and out; Gas-works Castings, Retorts and Bench Castings for Coal Gas-works,; Cast-Iron Street Mains, Bends, Branches, Drips, &c.

Gas and Steam Fitters' Tools, &c.

STEPHEN MORRIS,
THOMAS S. TASKER,
CHAS. WHEELER,
STEPHEN M. P. TASKER.

J. VAUGHAN MERRICK, W. H. MERRICK,
JOHN E. COPE.

SOUTHWARK FOUNDRY,

FIFTH & WASHINGTON STREETS,

PHILADELPHIA.

MERRICK & SONS, Engineers,

MANUFACTURERS OF EVERY DESCRIPTION OF GAS MACHINERY.

Retorts, Bench Castings, Condensers, Washers, Scrubbers, Wet or Dry Lime Purifiers, Coke Wagons, Fire Tools, Wrought Iron Grate Bars, Gas holders, either Telescopic or Single, with Suspension Frames complete; Wrought Iron Roof Frames, for Iron or Slate; Stop Cocks, Exhausters, Steam Pumps, Boilers and Tanks, Steam of Hand Air Pumps for providing Street Mains, Centre Seals, Governors, Wrought or Cast-Iron, Line Sleves for Purifiers, Purifier Hoisting Machines, &c., &c.

Address— MERRICK & SONS,
5th and Washington Sts, Philadelphia.

S. FULTON & CO.,

(Successors to Colwell & Co.)

Manufacturers of

PIG IRON & CAST IRON GAS & WATER PIPES.

Also, Heavy & Light Castings of every description, No. 207 North Water street and 206 North Wharves, Philadelphia.

SAMUEL FULTON, THEO. TREWENDT

TO GAS COMPANIES.

THE UNDERSIGNED DESIRES TO undertake the supervision of several small Gas-works, to visit and examine them as often as may be necessary; to obtain and inspect their coal, castings, fire-brick, and other materials; and to manage their general business in such a manner that they shall be under such supervision as is now attainable in large works, at much increased cost. Also, to advise as general Consulting Engineer and expert in practical chemistry.

CHAS. M. CRESSON,
Late Asst. Engineer of the Philadelphia Gas-works
417 Walnut st., Philadelphia.

POOLE & HUNT,
BALTIMORE, MD.,
are prepared to execute orders for
GAS-HOLDERS,
IRON-ROOF FRAMING,
And other descriptions of
Iron Work for Gas-Works, Water-Pipes, and Heavy Castings, and Machinery generally.

GEO. H. KITCHEN & CO.,

NEW PATENT

GAS APPARATUS

For Country Residences, Public Buildings, &c.,

FROM $300 UPWARDS.

EVERY DESCRIPTION OF GAS FIXTURES.

Gas Fitting in all its banches

561 Broadway,
NEW YORK.

THE WOODWARD
Steam Pump Manufacturing Company,

MNUFACTURERS OF THE WOODWARD PATENT IMPROVED

SAFETY STEAM PUMP,

—Adapted for Mining and Fire Purposes—and

Steam, Water & Gas Fittings of All Kinds.

Also, Wholesale and Retail Dealers in WROUGHT IRON PIPE, BOILER TUBES, etc.,

Woodward Building, 76 and 78 Centre Street,

corner of Worth street, Formerly 77 Beekman Street, *New York.*
53 GEO. M. WOODWARD, Pres't. 64

JOSEPH LENNIG,

1615, 1617, and 1619 Francis St.,

Above Ridge Avenue, Philadelphia, Pa.,

MANUFACTURER OF

Wet and Dry Gas Meters,

STATION, SHOW, & EXPERIMENTAL METERS,

Photometers, Pressure Registers, Indicators, and Gauges, Governors Meter Provers, Centre Seals, Fluid Gauges, &c.

GAS APPARATUS

Of the most reliable and approved construction manufactured and on hand at the

UNION GAS METER WORKS.

D. PARRISH, Jr.,

GAS ENGINEER

And Contractor for Coal or Oil Gas-Works.

Estimates given for Gas-Works, Gas-Holders, or any Gas Apparatus.

205 1-2 Walnut st., Philadelphia, Pa.

Box 1956, Post Office.

To Manufacturers of Petroleum Gas.

For sale, Parrish's Patent Gas and Air Mixer, adapted to all works using Petroleum or other oils, by which rich Petroleum Gas is mixed, after it leaves the holder, with a proper proportion of air, giving it the greatest illuminating power, without smoke, through any burners. The apparatus being attached to the outlet pipe, requires no alteration of the works.

Apply at the Gas-Works of St. Nicholas Hotel, No. 63 Mercer st., N. Y., where one can be seen in operation; or address D. Parrish, Jr., St. Nicholas Hotel, New York city, or No. 1416 Arch street, Philadelphia.

SAVING OF FUEL TO PARTIES USING STEAM.
DAMPER REGULATORS.

Guaranteed to effect a great saving in fuel and give the most perfect regularity of power. For sale by the subscribers, who have established their exclusive right to manufacture dan per regulators, using diaphragms or flexible vessels of any kind. CLARK'S PATENT STEAM AND FIRE REGULATOR COMPANY, No. 117 Broadway, New York.

THE AUBIN BALLANCED

VALVE WATER METER,

(Used also for Oils and Liquors)

Is now in use by many City Water Cos, because of its low price, simplicity, durability, accuracy under any pressure, and (a great advantage) because it runs with less head than any meter used. Manufactured by H. Q. HAWLEY, Albany, N. Y.

WEST'S IMPROVED PUMPS, the most Simple, Durable, and Powerful, and the Cheapest in use.

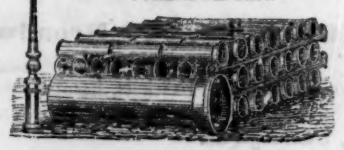
J. D. WEST & CO.,
No. 40 Cortland street,

R. D. WOOD & CO.,

MANUFACTURERS OF

CAST-IRON PIPE, RETORTS, &c.

Office, 400 Chestnut Street, PHILADELPHIA.



Great Improvement
IN
Sewing Machines.
EMPIRE
SHUTTLE MACHINE!

Patented February 14th, 1860.

Salsroom, 536 Broadway.

This Machine is constructed on entirely new principles of mechanism, possessing many rare and valuable improvements, having been examined by the most profound experts, and pronounced to be SIMPLICITY and PERFECTION COMBINED.

It has a straight needle, perpendicular action, makes the LOCK or SHUTTLE STITCH, which will NEITHER RIP nor RAVEL, and is alike on both sides; performs perfect sewing on every description of material, from Leather to the finest Nansook Muslin, with cotton, linen, or silk thread, from the coarsest to the finest numbers.

Having neither CAM nor COG WHEEL, and the least possible friction, it runs as smooth as glass, and is

Emphatically a Noiseless Machine!

PRICE OF MACHINES,

COMPLETE:

No. 1, Family Machine, with Hemmer, Feller, Gauge, Braider, & Corder, complete. - - - $60
No. 2 Small Manufacturing, with Extension Table, $75
No. 3. Large Manufacturing, with Extension Table, $85
No 3. Large Manufacturing, for Leather, with Rolling Foot and Oil Cup, 100

One-half hour's instructions is sufficient to enable any person to work this Machine to their entire satisfaction.

Agents Wanted in all Towns in the United States, where Agents are not already established. Also, for Cuba, Mexico, Central and South America, to whom a liberal discount will be given Terms, invariably CASH on delivery.

T. J. McARTHUR & CO.,
536 Broadway.

GAS-BURNERS.

WIGHTMAN BROS.,

IMPORTERS AND

SOLE AGENTS

For the United States and Canada, of

SCHWARZ'S

GERMAN LAVA GAS-TIPS

And proprietors of Winchester's Improved

LAVA TIP GAS BURNERS,

No. 25 Kilby Street,

BOSTON, MASS.

T. G. ARNOLD,

MANUFACTURER OF

GAS-BURNERS,

And Importer of SCOTCH TIPS,

224 and 226 West 21st street,

formerly No. 447 BROOME ST., New York.

Mercury Cups, Portable Sockets, Burner Pillars, Burner Pliers, &c., &c.

C. GEFRORER,

Manufacturer of

GAS-BURNERS,

For Lighting and Heating Purposes.

GAS HEATING AND COOKING APPARATUS; FITTERS' ROVING APPARATUS, &c.

529 Commerce st., bet. Market & Arch, Philadelphia

JOSEPH LEES,

Sole Agent for the sale of

Thompson's Gas Controller

in the States of

CALIFORNIA AND OREGON,

San Francisco, Cal.

Carrington & Co.'s

GENERAL

PURCHASING

AGENCY,

In Connection with all the Expresses

No. 30 Broadway,

NEW YORK.

Established 1854.

Purchases to order any article wanted from New York, or Europe, for ladies' or gentlemen's use or wear,---comfort or luxury,---from a cameo to a cashmer, a seal ring to a steam engine.

Goods purchased at current City prices, and forwarded by Express or as directed.

Commission, Five Per Cent

Remittances, with orders, can be made by Express if preferred, as all Express Agents will take orders, receipt for and forward funds, and see to return of Goods.

THE HAVANA

MEXICAN & BRAZILIAN

EXPRESS.

CARRINGTON & CO.

30 Broadway.

Express for HAVANA and ISLAND OF CUBA by regular steamships weekly.

Express for MEXICO and VERA CRUZ on the 10th and 16th of every month.

Express for ST. THOMAS, BAHIA, and RIO DE JANEIRO each month.

Packages received for United States Brazil Squadron.

Freights should be sent to our office day before sailing of steamer, with invoice, contents and value.

FINKLE & LYON'S

New Family

SEWING MACHINE

Should be known in

IN EVERY TOWN.

To accomplish this at once and save the expense of a *Travelling Agent*, we offer thus, viz:

Any one sending us orders for two machines shall receive one machine free of charge. This proposition cannot avail after we have appointed a local agent in the town.

We have now completed our *new manufacture* at a cost of some $200,000—introducing *new patents*, and such important improvements, that without fear we are able to offer the following stringent guarantee, viz: After a fair trial, if any purchaser does not prefer the FINKLE & LYON FAMILY SEWING MACHINE to any other, he can return it and have back his money.

This machine has taken many of the HIGHEST PRIZES; *is less complicated than any other first class machine; does a wider range of work without changing; requires no taking apart to clean or oil, no "lessons" to set needle, regulate tension or operate machine.*

Our new Manufacturing Machine is sold on the same terms as the Family Machine.

Please send for a circular with samples of sewing.

Finkle & Lyon S. M. Co.

No. 581 BROADWAY, NEW YORK.

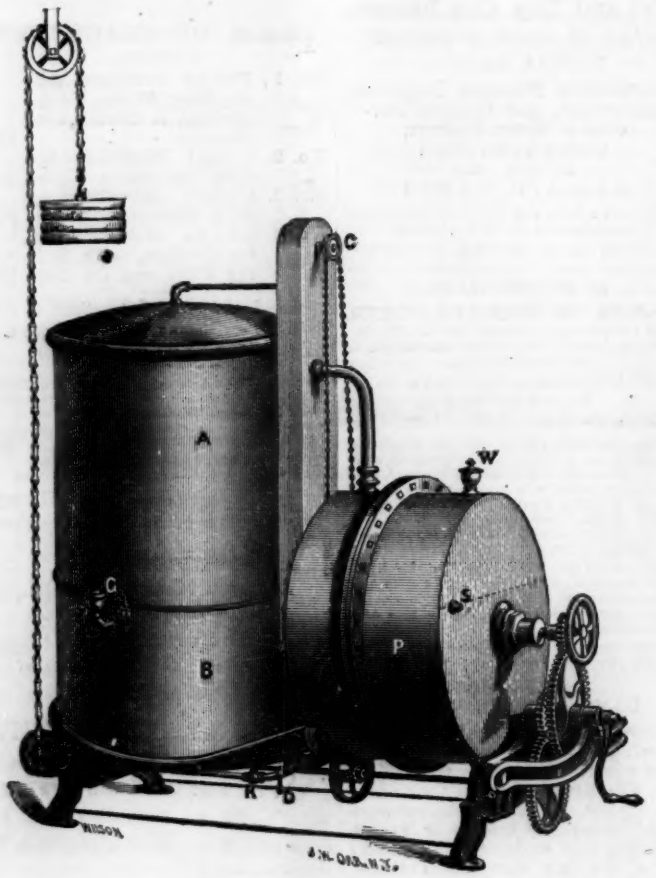
EMPIRE STATE GAS MACHINE,

LEVI STEVENS' PATENT, FOR SUPPLYING,

Dwellings. Stores, Factories and Public Buildings.

THE GAS GENERATED BY THIS MACHINE

Is a mixture of the vapor of hydro-carbon with common air. The mechanical devices employed are such as, from a long experience and critical examination into the nature of the element brought into use, seem best adapted to secure a certain and satisfactory result. GASOLINE, the liquid employed, is the more volatile portions of Petroleum, of a specific gravity of 0.6587. This liquid exposed to the action of this machine is vaporized, and a close mechanical mixture of the vapor with common air is effected. The value of the gas produced, its permanency, its illuminating quality, and freedom from liability to condensation, depend almost entirely upon the perfect and uniform character of this mixture. Hence the great importance of mechanical means adapted to secure all the conditions requisite in a Portable Gas Machine.



THE PRICE-LISTS OF MACHINES COMPLETE;

(Boxed and delivered on the cars at the Manufactory.)

No. 1,	$150,00	5	Argand Burners.
do. 2,	250,00	10	do.
do. 3,	350,00	20	do.
do. 4,	450,00	35	do.
do. 5,	600,00	60	do.
do. 6,	1,000,00	125	do.
do. 7,	1,500,00	250	do.

This machine will produce the most brilliant and steady light without Fire or Heat, and is warranted to operate in every respect as represented.

The EMPIRE STATE GAS MACHINE is the most SIMPLE and EFFECTIVE MEANS KNOWN FOR PRODUCING GAS WITHOUT HEAT.

Its action is automatic, feeding itself with constant supplies of Gasoline, thus securing steady and uniform supplies of Gas. The gas produced is equal to the best known Illuminating Gas. It is as economical as any other, and is adapted to a wider range of use for Lighting, Heating and Mechanical purposes. It will maintain its illuminating power under as great a degree of cold as any other. It is free from danger with the ordinary care in using gas. Its remarkably pure and steady light is pleasant for the eye. It renders it easy for persons living remote from street gas pipes to enjoy the luxury of a pure GAS-LIGHT, at a COMPARATIVELY SMALL COST, AND WITH LITTLE TROUBLE.

☞ The public are invited to witness its operations at our store. GASOLINE will be supplied by us, at market prices, or may be obtained from the various other sources of supply now going into operation.

MITCHELL, VANCE & Co., 620 Broadway, New York,

Manufacturers of Chandeliers and Gas Fixtures of every description. Also, Chandeliers, Brackets, Lamps, &c., for Coal Oil, adapted to Churches, Public Buildings, Dwellings, &c.